SERPENTINITE EMPLACEMENT AND DEFORMATION IN WESTERN PUERTO RICO AND THEIR IMPLICATIONS FOR THE CARIBBEAN-NORTH AMERICA PLATE BOUNDARY TECTONIC HISTORY

by

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Submitted to the Graduate Faculty of

Arts and Sciences in partial fulfillment

of the requirements for the degree of

Doctor of Philosophy

University of Pittsburgh

2008

UNIVERSITY OF PITTSBURGH

FACULTY OF ARTS AND SCIENCES

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SERPENTINITE EMPLACEMENT AND DEFORMATION IN WESTERN PUERTO RICO AND THEIR IMPLICATIONS FOR THE CARIBBEAN-NORTH AMERICA PLATE BOUNDARY TECTONIC HISTORY

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Serpentinite emplacement in southwestern Puerto Rico indicates a complex plate boundary history between the Caribbean and North America plates. In this study we investigate the kinematics of shear planes within the serpentinite to improve constraints on the tectonic evolution of the region. Shear planes collected within the Monte del Estado and Río Guanajibo serpentinites reveal two predominant groups. One group comprises northwesterly-striking thrust faults and easterly-striking left-lateral faults. A second group comprises northwesterly-striking right-lateral faults and easterly-striking thrust faults. These shear zones reveal two shortening directions that trend NE-SW and N-S. The N-directed shortening is interpreted be older and subsequent stress reactivated the shear planes. The SW-directed shortening is attributed to transpression that caused contraction, uplift, and left-lateral shearing of serpentinite. A subsidiary younger group comprising fewer faults consists of northerly-directed thrusts and northwesterly-directed left-lateral faults and may be related to the last transpressional deformation within Puerto Rico.

Thin-section observations show that porphyroclastic peridotite with pyroxenes that are kinked, show deformation lamellae, undulose extinction, and define foliation and lineation. Olivine shows a granuloblastic texture, and many crystals are strain-free and show polygonization indicating recrystallization. These textures indicate high temperature

deformation that formed prior to serpentinization. Crystal-plastic deformation, recorded by serpentine mylonite and serpentine veins, was followed by brittle faulting. These structures demonstrate that the serpentinite was deformed and uplifted by tectonic stresses at the Caribbean-North America plate boundary zone and not by diapirism as a result of buoyancy differences within the crust.

In southwestern Puerto Rico serpentinite emplacement has been described as first by collisional processes and second by diapirism. Structure mapping of the Monte del Estado and Río Guanajibo serpentinite bodies indicate that serpentinite was emplaced by thrusts verging towards the southwest in early Tertiary time. The thrust faults are mostly blind and produced fault-propagation folds in the overlying Late Cretaceous and Tertiary volcano-sedimentary cover. Low-angle thrusts are exposed in places at the southern contact of the Monte del Estado and Río Guanajibo serpentinite bodies and are interpreted to form part of the transpression that occurred in middle Tertiary at the boundary of the Caribbean-North America plates.

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ACKNOWLEDGEMENTS

I express gratitude to Thomas H. Anderson for agreeing to supervise my dissertation. His unwavering support through difficult times and across great distances between us is greatly appreciated. I am thankful for always pushing me to give my best and to question the established thought.

I extend thanks to Edward Lidiak, William Harbert, Ian Skilling, and Grenville Draper for providing useful advice, suggestions, and support during the production of this study. Many thanks to Brian Stewart, Dolly Chavez, Deanna Hitchcock, Matt Romick, Lorrie Robbins, Shannon Granahan, and fellow graduate students at the Department of Geology and Planetary Science at the University of Pittsburgh for always being there whenever I needed them.

I recognize James Joyce, Hernán Santos Mercado, Johannes Schellekens, Aaron Cavosie, Reynard Rohena, Edgardo Pujols, Miguel Santos Rivera, and Rafael Morales from the Department of Geology at the University of Puerto Rico, Mayagüez for their help during fieldwork. I credit Wayne Jolly, Pablo Llerandi Román, and Patricia Campbell for insightful discussions and suggestions.

I am indebted to the Departamento de Recursos Naturales y Ambientales for providing permits and support for working in the national forests of southwestern Puerto Rico. Especially, I thank Wetsy Cordero and Adrián Muñiz for bringing assistance while working in the Susúa and Monte del Estado forests.

I am grateful to the Laó Dávila, Alvarado Albertorio, and Albertorio Rivera families for all their help and support. This investigation would have been even more difficult without their assistance.

This research was supported by grants from Exxon-Mobil and the Geological Society of America Graduate Student Grant. The Leighton Scholarship at the University of Pittsburgh provided additional funds.

DEDICATION

I dedicate this dissertation to Frances for patiently supporting my goals for so many years and to our child for confirming that everything is possible if you truly believe in it.

1.0 INTRODUCTION

1.1 CARIBBEAN TECTONICS

The Caribbean plate is a plate mostly consisting of oceanic lithosphere between the North American, South American, Cocos, and Nazca plates (Figure 1.1). Its boundaries to the east and west are defined by subduction zones above which volcanoes of the Lesser Antilles and the Central America are prominent. Atlantic and Pacific lithosphere sinks, respectively, under the Caribbean plate at these margins. Strike-slip faults define the northern and southern boundaries. Sea-floor spreading occurs in the Cayman trough where a southward step of the northern strike-slip boundary creates a pull-apart basin (Rosencrantz et al., 1988). Estimates of spreading based upon magnetic anomalies in the Cayman trough suggest approximately 1,100 km of left-lateral offset (Rosencrantz et al., 1988). The central Caribbean plate is an anomalously thick oceanic plateau, whose upper portions formed around 89 Ma (Donnelly, 1973; Kerr et al., 1997; Revillon et al., 2000).

Tectonic interactions among the Caribbean, North American and South American plates are recorded in the rocks of the Greater Antilles and northern South America. The Greater Antilles, consisting of Cuba, Hispaniola, Jamaica and Puerto Rico, lie within or close to the Caribbean-North American plate boundary zone (Figure 1.1). The current plate boundary corresponds with left-lateral sense of motion with a northeast-directed compressive strain

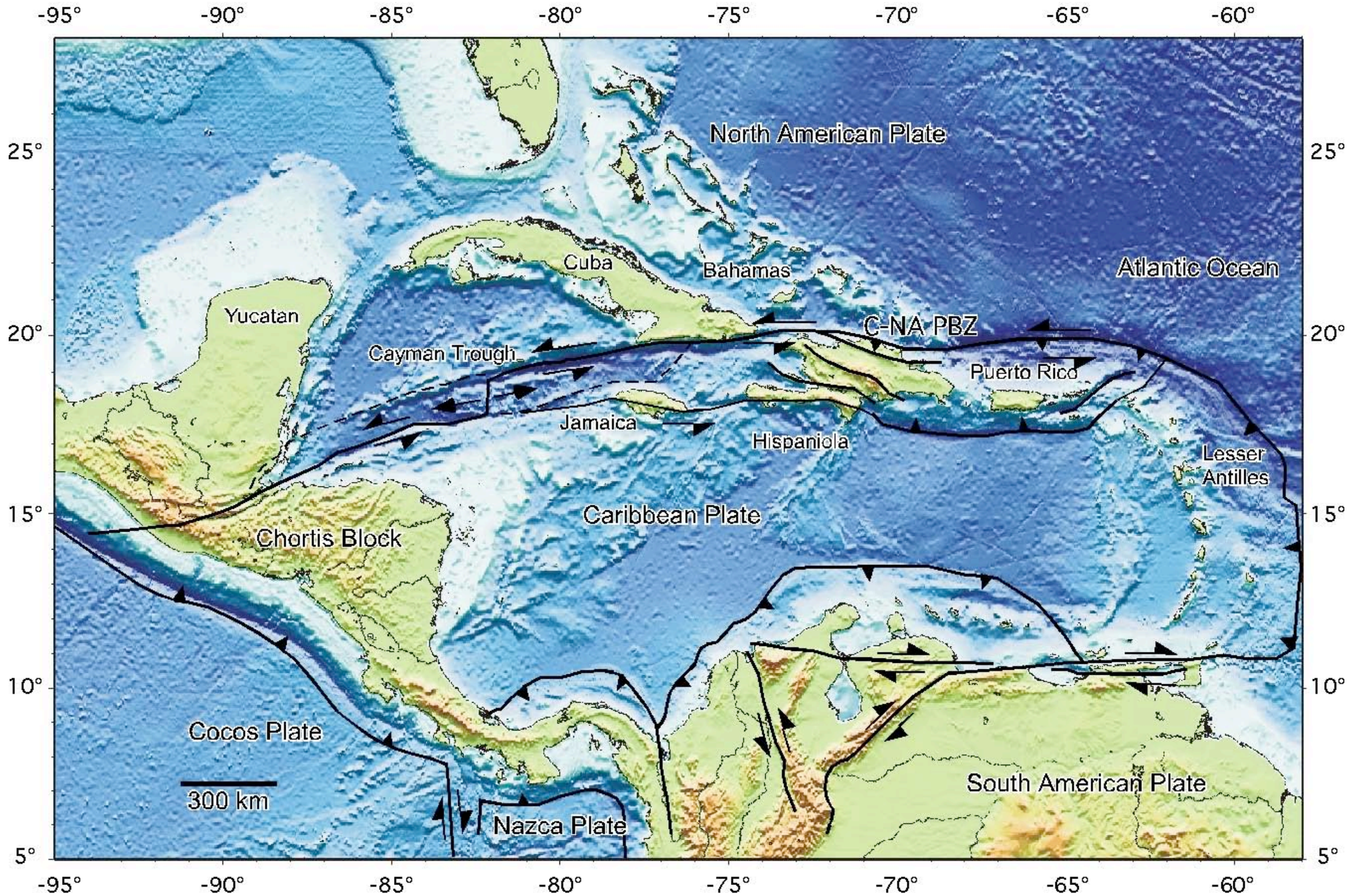


Figure 1.1: Tectonic Setting of the Caribbean plate (Pindell, 1994). Subduction occurs along the east and west margins, and lateral faults bound the northern and southern plate margins. Underthrusting is occurring in northwestern South America and to the south of Puerto Rico. Modified image from Smith and Sandwell (1997), and Wessel and Smith (1991). C-NA PBZ = Caribbean-North American plate boundary zone.

(DeMets et al., 2000). However, its sense of slip changes gradually from oblique left-lateral north of Puerto Rico to left-lateral south of Cuba (Mann and Burke, 1984). The collision of the Antillean arc with the passive margin of northern South America started in Late Cretaceous and continued into the Neogene (Ostos et al., 2005). Underthrusting and right-lateral faulting characterizes the southern margin of the Caribbean plate.

The Caribbean plate may have originated in the realm of the Proto-Pacific Ocean during the Early Jurassic (Montgomery et al., 1994a; Pindell, 1994; Pindell et al., 2005; Figure 1.2). The paleo-geography is suggested by pelagic chert from Sierra Bermeja in southwestern Puerto Rico, Duarte Complex in Hispaniola, and in La Desirade that contains radiolaria of Early Jurassic to Cretaceous age, which belong to faunal zones related to a Pacific realm (Montgomery et al., 1994a, 1994b). The Proto-Caribbean formed between the North American and South American plates in the Late Triassic during extension between the two plates (Pindell, 1994). Early Cretaceous tholeiitic island-arc rocks (primitive island arc), exposed in Cuba, Hispaniola, Puerto Rico and Virgin Islands, indicate the onset of volcanism at the eastern boundary of the Caribbean plate (Donnelly and Rogers 1980; Donnelly et al., 1990; Kesler et al., 2005). From 100 to 120 Ma, a subduction polarity reversal may have occurred (Mattson, 1979; Pindell, 1994; Draper et al., 1996; Jolly et al., 2008). In the model by Pindell et al. (2005), the Cretaceous island arc moved northeasterly with respect to the North American and South American plates and occupied the basin created by the separation of these large continental plates. The Proto-Caribbean lithosphere was subducted during movement of the arc. Around 89 Ma, large volcanic eruptions at the western side of the eastern island arc created the Caribbean plateau, which became the center of the Caribbean plate and set the stage for its "modern" tectonic history (Kerr et al., 2003). Starting in the Late Cretaceous, parts of the Caribbean

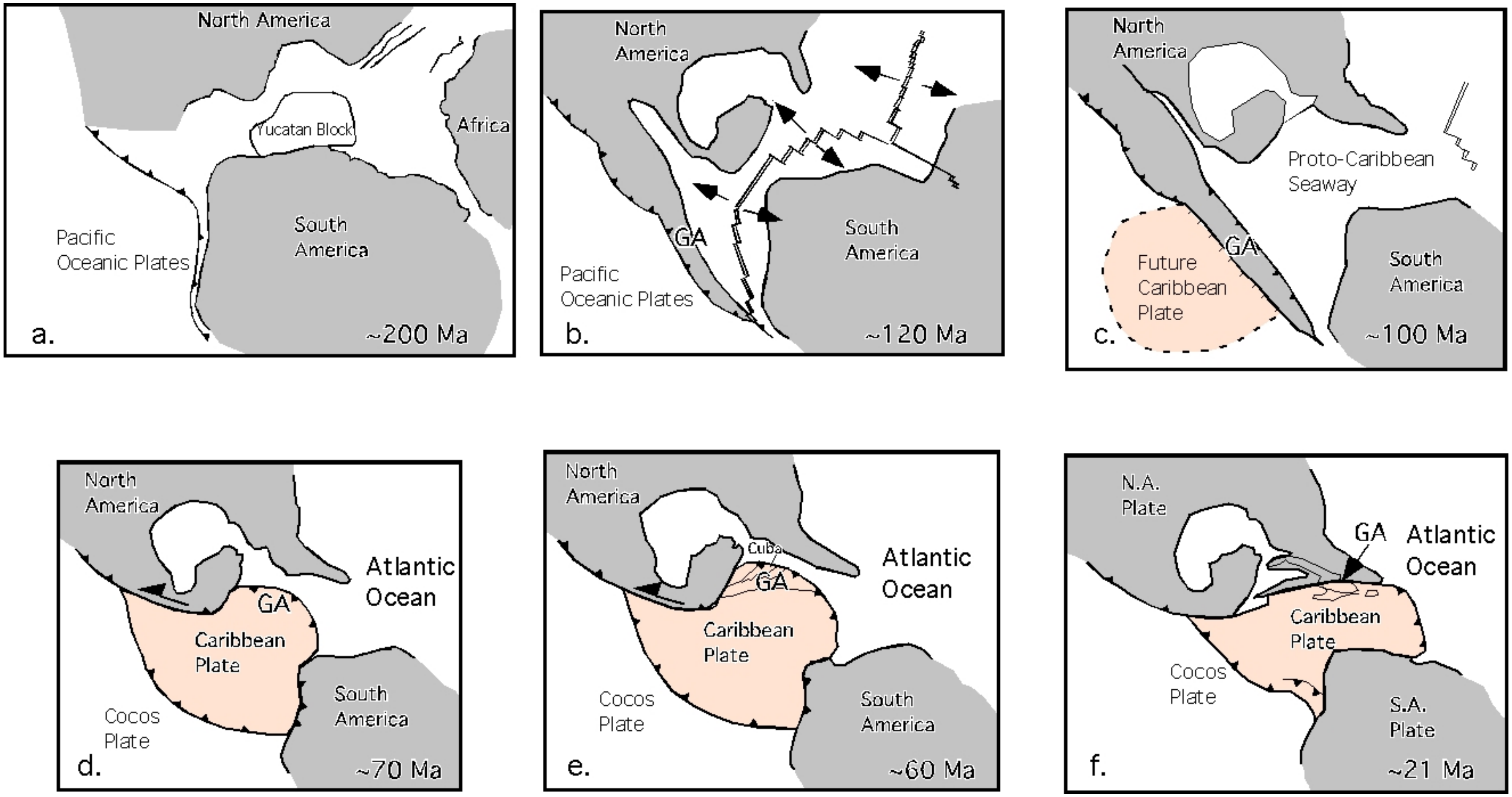


Figure 1.2: Simplified Caribbean plate tectonic model (Pindell, 1994). (a) Northeast-directed subduction at western margins of North America and South America, (b) Extension between the two plates and primitive island arc volcanism, (c) Start of southwest-directed subduction, (d) Oceanic plateau basalts have erupted and continues the relative northeast movement of Caribbean plate, (e) Start of Collision of Cuba with the North American plate followed by start of lateral faulting at northern and southern boundaries, (f) Continued left-lateral movement on the northern boundary. Grey areas represent topographically high areas. GA = Greater Antilles.

basalt plateau were obducted on continental crust of the South American plate, the Central America region, and the Greater Antilles (Hauff et al., 2000; Kerr et al., 2003; Kerr and Tarney, 2005; Jolly et al., 2007; Hastie et al., 2008).

Continued northeast movement of the Caribbean plate relative to the North American plate produced the collision of Cuba with the North American plate in Paleocene-Eocene (Bralower and Iturralde-Vinent, 1997; Pindell et al., 2006). Cuba was obducted northward onto the North American plate, becoming part of it (Iturralde-Vinent, 1996).

A change in tectonism occurred at the North American-Caribbean plate boundary from convergent to highly oblique left-lateral convergence (Pindell, 1994). Opening of the Cayman trough and rifting in the Yucatan basin followed (Rosencrantz, 1996). The change in style at the plate boundary created left-lateral transpression that separated Cuba, Hispaniola, and Puerto Rico in late Eocene-early Oligocene (Figure 1.3; Pindell and Barrett, 1990). In Puerto Rico, strong deformation stopped in the mid-Oligocene and was followed by slight tilting of 5° to 25° toward the sea of limestone platforms in the Miocene suggesting arching of the lithosphere (Larue, 1994; van Gestel et al., 1999). Left-lateral oblique slip movement continues today along the northern plate boundary (e.g. Jansma et al., 2000).

1.1.1 Serpentinites in the Northern Caribbean

Serpentinite emplacement has occurred at the Caribbean-North American plate boundary since Early Cretaceous (Lewis et al., 2006a). Serpentinite crops out on each of the islands of the Greater Antilles (Figure 1.4). Geologic relationships reveal diverse emplacement mechanisms and timing (Lewis et al., 2006a). Serpentinite bodies in Cuba, which are the largest and the most abundant during two main episodes, were mainly emplaced above northward-directed thrust

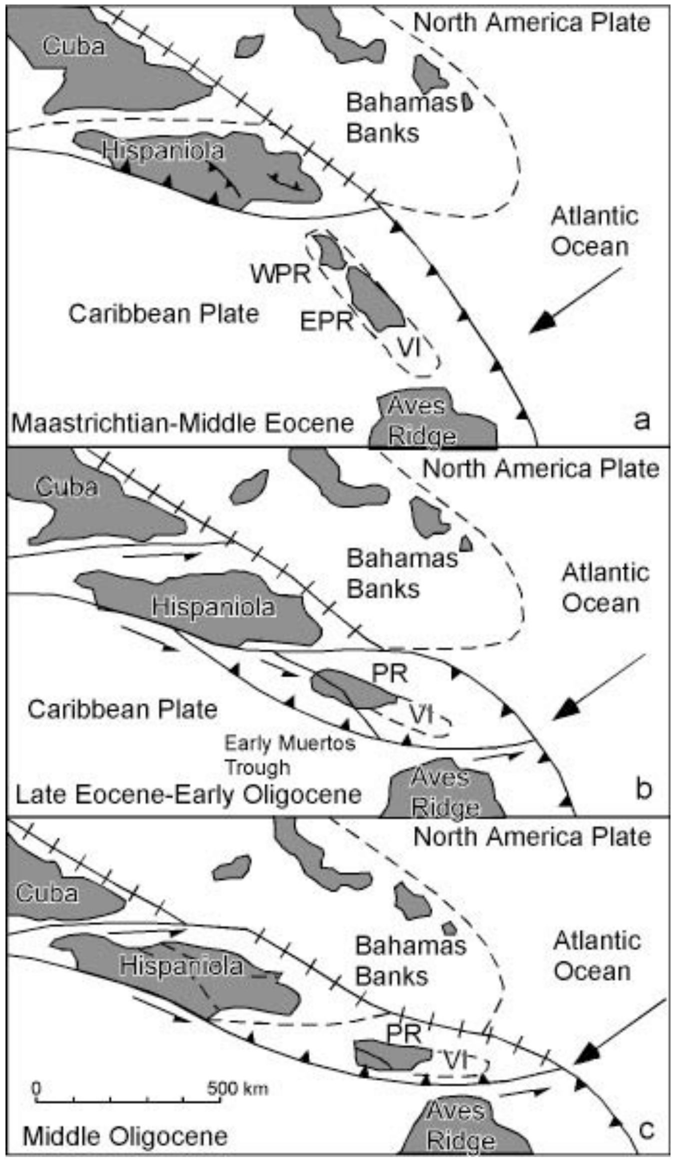


Figure 1.3: Maastrichtian to middle Oligocene tectonic evolution of the northeastern Caribbean from (Pindell and Barrett, 1990; Erikson et al., 1990). VI = Virgin Islands, EPR = eastern Puerto Rico, WPR = western Puerto Rico, PR = Puerto Rico.

faults during three main events: Early Cretaceous, Late Cretaceous, and Paleocene-Eocene (Iturralde-Vinent, 1996; Cobiella-Reguera, 2005; Lewis et al., 2006a; Figure 1.5).

In Hispaniola, the Loma Caribe serpentinite may have been emplaced by northward thrusting in mid-Cretaceous (Lewis, 1981; Draper et al., 1996). Serpentinite in the North Coast belt, previously suggested to be emplaced in the Paleocene by diapirism (Draper and Nagle, 1991), may have been emplaced by upward movement in a subduction channel (Draper, personal communication). In Jamaica serpentinite was emplaced in Maastrichtian-Paleocene time (Wadge et al., 1982; Abbot et al., 1999). Mattson (1960; 1973) proposed that serpentinite in Sierra Bermeja of southwestern Puerto Rico was emplaced as a northward-directed thrust in Early Cretaceous.

1.1.2 Geology of Puerto Rico

Volcanic activity dominates the geologic history of Puerto Rico as shown by Cretaceous to Eocene volcanic rocks that record about 80 million years of volcanism related to subduction, with large Late Cretaceous to early Tertiary co-genetic intrusions (Figure 1.6; Jolly et al., 1998b). Early Jurassic to Early Cretaceous chert, ultramafic, and metamorphic rocks that crop out in the southwestern part of the island provide information about the early history (Mattson, 1960; Montgomery, et al., 1994a; Schellekens, 1998; Figure 1.5). Late Tertiary limestone, on the northern and southern coasts, marks the transition between predominantly volcanic activity and predominantly sedimentary deposition. Folds and faults in Late Cretaceous to early Tertiary rocks record the initiation of contraction, underscored by left-lateral and contractional deformation along the Northern Puerto Rico Fault Zone (NPRFZ) and the Southern Puerto Rico Fault Zone (SPRFZ; Pease, 1968; Glover, 1971). Estimates of left-lateral displacements range from 22 km to 50 km along both fault zones (Briggs and Akers, 1965; Glover, 1971; Erikson et al., 1990). These fault zones separate the island into the northeast, central, and southwest structural blocks (Figure 1.6).

Aptian-Albian volcanic rocks in the central and northeast blocks are island-arc tholeiite and calc-alkaline in geochemical composition. They are considered to represent the primitive island arc rocks that formed close to the Proto-Pacific plates (Jolly et al., 1998a; Jolly et al., 2006). High-K lavas comprise Cenomanian volcanic rocks in the central block (Jolly, 1971). Jolly et al. (1998a) suggest that in the central and northeast provinces there is a volcanic progression from oldest rocks (Aptian) to the south to younger rocks (mid-Eocene) to the north. Volcanic rocks in the central block are located between the mainly felsic San Lorenzo batholith and the Utuado pluton, which are Late Cretaceous to Paleocene in age (Smith et al., 1998). The northwest trending Barranquitas anticlinorium is the main deformational structure that formed during the Late Cretaceous within the central block (Glover, 1971).

Across the poorly defined fault that characterizes the SPRFZ, the southwest block includes the highly deformed Paleocene to mid-Eocene Cerrillos belt that abuts the Utuado pluton separating the central and southwest blocks (Glover, 1971; Dolan et al., 1991). Thin- to massive-bedded turbidite, volcaniclastic, and volcanic rocks compose the Cerrillos belt (Glover, 1971; McIntyre, 1975; Laó-Dávila, 2002). Serpentinite is also conspicuous where it is exposed within the Sierra Bermeja, Monte del Estado, and Río Guanajibo belts (Mattson, 1960; Figure 1.6). In the Sierra Bermeja, the serpentinite, chert containing Early Jurassic- Early Cretaceous radiolaria, schist, gneiss, and metabasalt form serpentinite mélange (Mattson, 1960; Mattson and Pessagno, 1979; Schellekens, 1998). No Aptian-Albian volcanic rocks of the primitive island arc suite crop out in the southwest block. Jolly et al. (2007) suggest that the distribution of two-

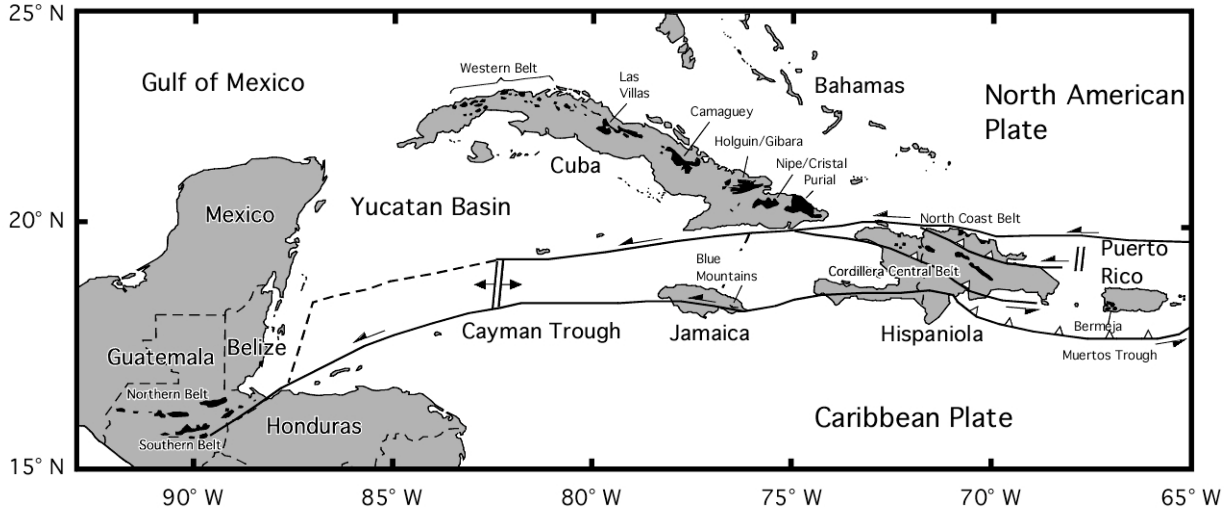


Figure 1.4: Tectonic setting of the northern plate boundary zone between the Caribbean and North American plates. Black areas indicate the location of ultramafic rocks including serpentinite (modified from Wadge et al., 1984).

pyroxene high-Mg andesite, high-Fe basalt, and hornblende bearing basalt and andesite in southwest Puerto Rico is analogous to Cenozoic arcs. They further propose northeast-dipping subduction in southwest Puerto Rico between 85 and 65 Ma that may have occurred at the same time as the southwest-dipping subduction north of Puerto Rico.

1.2 OBJECTIVES OF THIS STUDY

The objectives of this study are to improve understanding of the deformation and the emplacement of the Monte del Estado and Río Guanajibo serpentinite, as well as the age of emplacement. The primary goal of this study is to characterize structures both within the serpentinite and at its contacts with overlying and underlying rocks. Recognition of the style of serpentinite deformation and emplacement will help to reveal the role of serpentinite in collision processes at obliquely convergent boundaries. Moreover, the conclusions from this new study will lead to further understanding of the tectonics of southwest Puerto Rico and the Caribbean-North American plate boundary zone.

1.3 ULTRAMAFIC ROCKS, SERPENTINIZATION, AND EMPLACEMENT

1.3.1 Peridotite

Peridotite, an ultramafic rock, is the most abundant rock in the lithosphere. A typical cross section of the oceanic lithosphere shows peridotite at the base underlying cumulates transitional into gabbro, dikes feeding pillow basalts, and chert or limestone (Figure 1.7). Gabbro and basalt form in response to partial melting of the peridotite during divergence at oceanic ridges. Peridotite consists of more than 40% olivine, and may contain orthopyroxene, clinopyroxene, and spinel and/or garnet (Best and Christensen, 2001). The three main types of peridotite based on modal compositions of olivine and pyroxene are dunite, harzburgite, and lherzolite (Figure 1.8).

Where oceanic lithosphere cools and then sinks at subduction zones under less dense plates the subducted peridotite reaches depth where it is exposed to high pressure and temperature. Subduction and divergence processes constitute a cycle during which mantle rock is exposed to different pressures and temperatures, and partially melted. However, this cycle commonly is interrupted by collision that occurs at convergent plate boundaries, during which

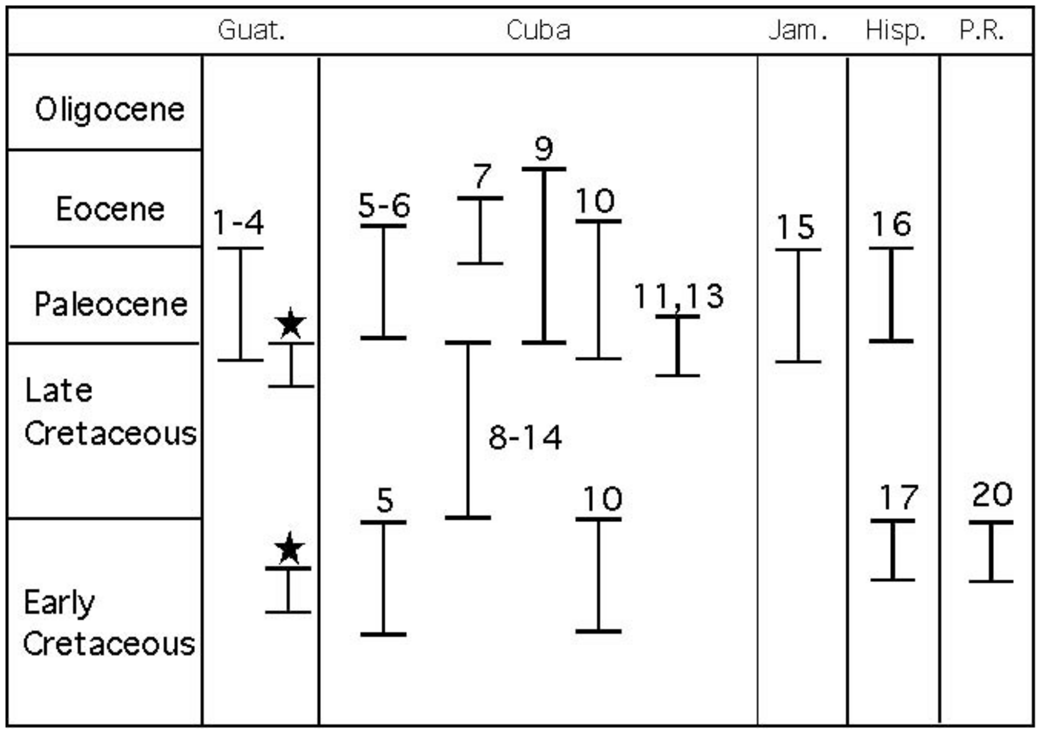


Figure 1.5: Times of emplacement for serpentinite in the northern Caribbean. Ages and numbers correspond to ultramafic units from Lewis et al. (2006a), and stars correspond to data from Harlow et al. (2004). (1) Sierra de Santa Cruz, (2) Baja Verapaz Unit, (3) Juan de Paz, (4) El Tambor Group, (5) Cajálbana, (6) Habana-Matanza, (7) Villa Clara, (8) Escambray, (9) Camagüey, (10) Holguín, (11) Mayarí-Cristal, (13) Moa-Baracoa, (14) Sierra del Convento, (15) Arntully, (16) North Coast belt, (17) Loma Caribe, (20) Sierra Bermeja. Guat.= Guatemala, Jam.= Jamaica, Hisp. Hispaniola, P.R.= Puerto Rico.

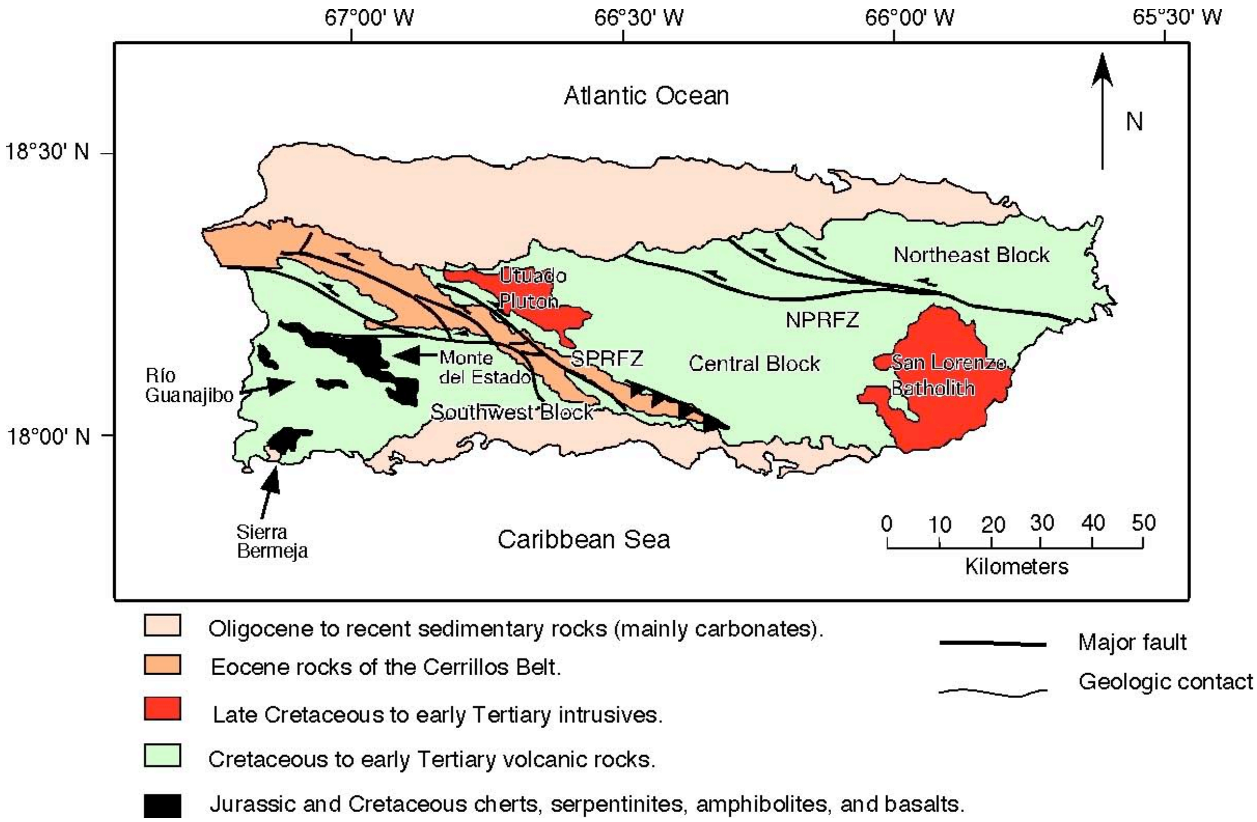


Figure 1.6: Generalized geologic map of Puerto Rico showing location of serpentinite bodies and major fault zones. The Southern Puerto Rico Fault Zone (SPRFZ) and the Northern Puerto Rico Fault Zone (NPRFZ) separate the island into three blocks (modified from Monroe, 1980).

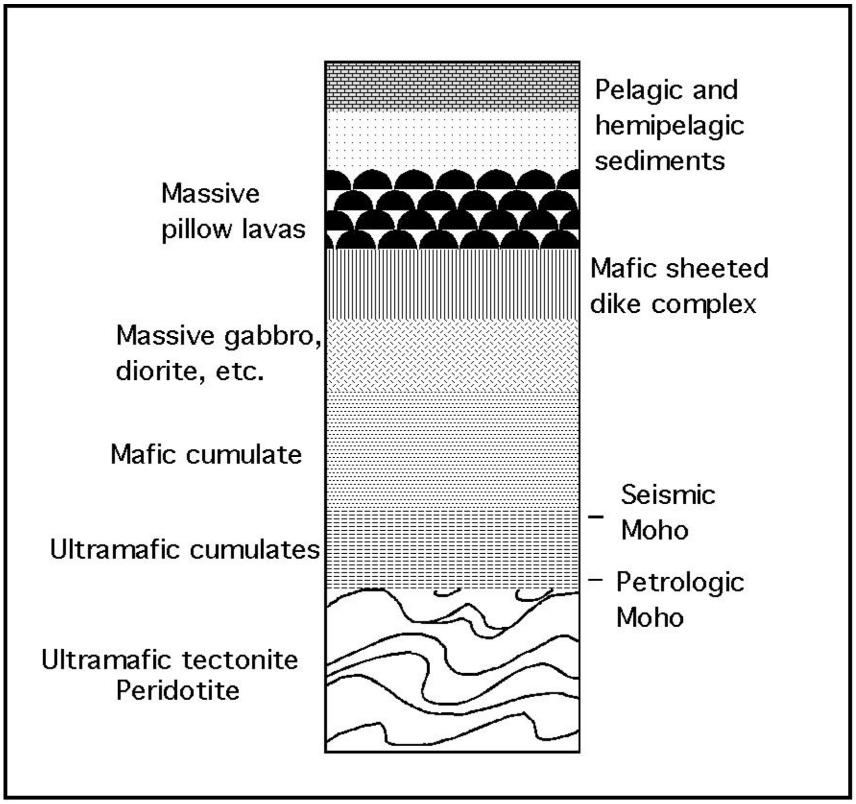


Figure 1.7: **Cross-section of ophiolite section as defined by the Penrose field conference (Anonymous, 1972; Best and Christiansen, 2001; Moores, 2002). Cross-section is approximately 5 km thick.**

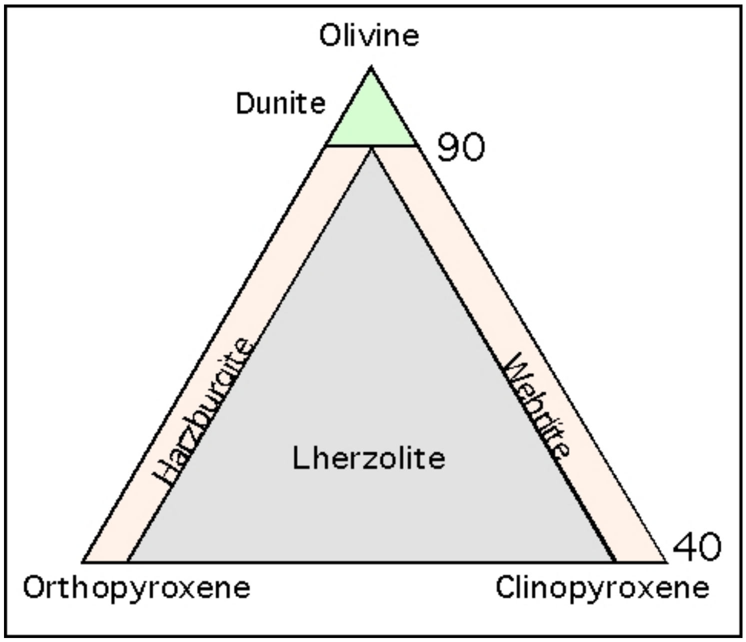


Figure 1.8: IUGS peridotite classification composed of olivine, orthopyroxene, and clinopyroxene (Le Maitre, 1989).

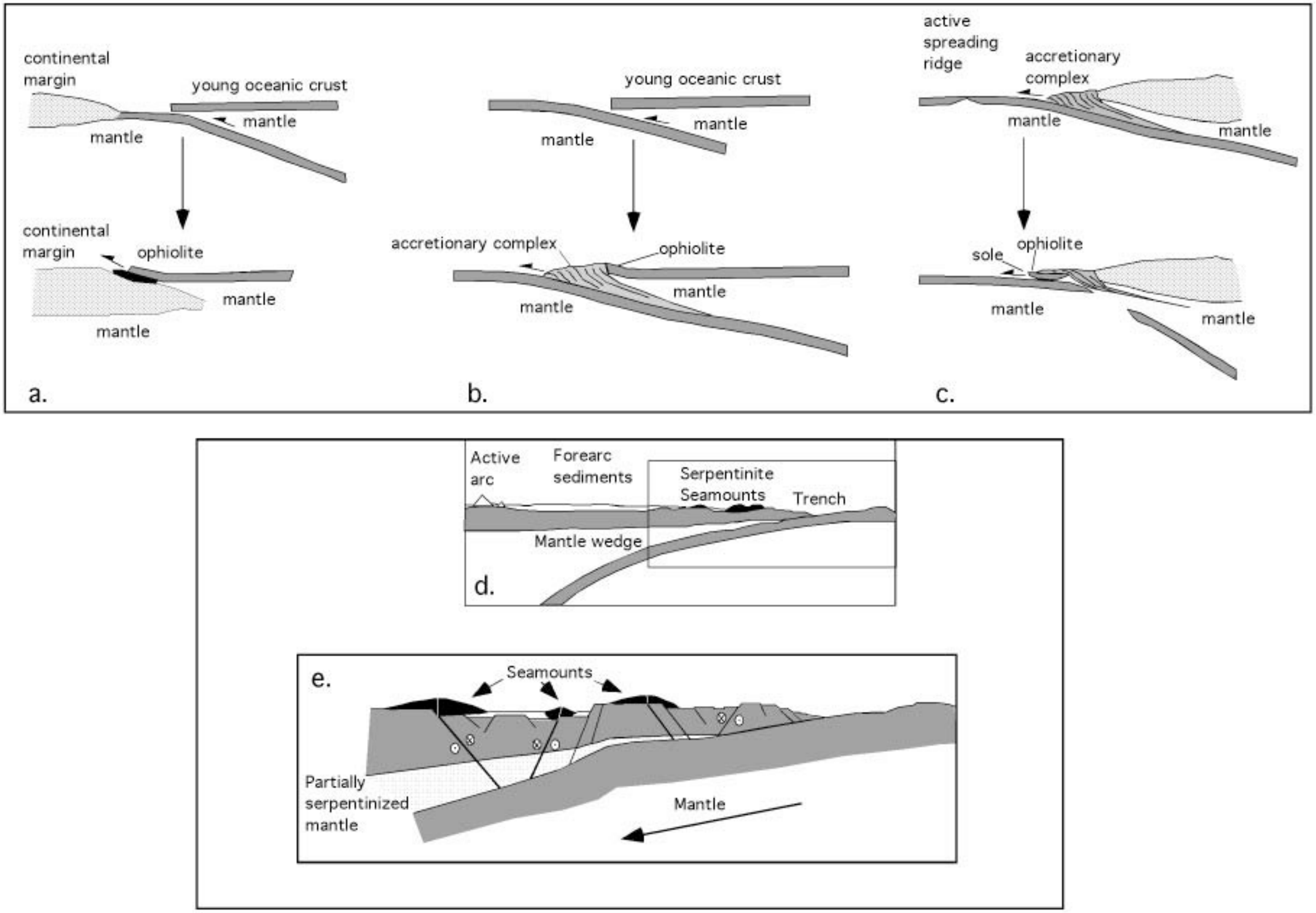


Figure 1.9: Tectonic models for serpentinite emplacement (Wakabayashi and Dilek, 2003; Oakley et al., 2007). (a). Tethyan or collisional emplacement, (b). Cordilleran or accretionary emplacement, (c). Ridge-trench emplacement, (d). Serpentinite seamounts near trench, (e). Detail of (d) showing mud diapir emplacement.

the peridotite may be obducted onto buoyant crust (Figure 1.9). A fragment of obducted oceanic lithosphere is called an ophiolite and many examples crop out at present and ancient convergent plate boundaries (e.g. Cox et al., 1984; Moores, 2002; Spaggiari et al., 2004). Rarely, ultramafic intrusions bring mantle rocks to the lithosphere (e.g. Karson et al., 1983; Reiners et al., 1996). The hydration of peridotite creates serpentinite, a rock with different rheological and physical properties. Mid-ocean spreading and obduction facilitate the encounter of peridotite and water.

1.3.2 Serpentinite

Serpentinization is the process in which ultramafic minerals change to serpentine minerals. Serpentinite is a metamorphic rock that forms from the hydration of peridotite, as well as gabbro, marble, and siliceous dolomite at low-grade metamorphic conditions (O'Hanley, 1996). In a peridotite protolith, olivine and pyroxene change to lizardite, chrysotile, and antigorite, which are the serpentine rock-forming minerals. Lizardite and chrysotile are found in sub-greenschist-facies rocks (O'Hanley, 1996). Whereas antigorite is the only serpentine mineral present in greenschist- and amphibolite-facies serpentinite (Evans, 1977), lizardite and antigorite are present in blueschist-facies serpentinites (O'Hanley, 1996). Evans (2004) states that lizardite generally forms at 50-300°C by hydration of peridotite, that chrysotile forms in veins and replacements at 0-400°C, and that antigorite forms by recrystallization of peridotite and hydration of peridotite at 250-600°C (Figure 1.10). Secondary minerals such as brucite, talc, and magnetite also form in the reaction.

During serpentinization water flows through fractures and grain boundaries affecting first the exterior of the rock then working its way towards the interior. Serpentinization increases the

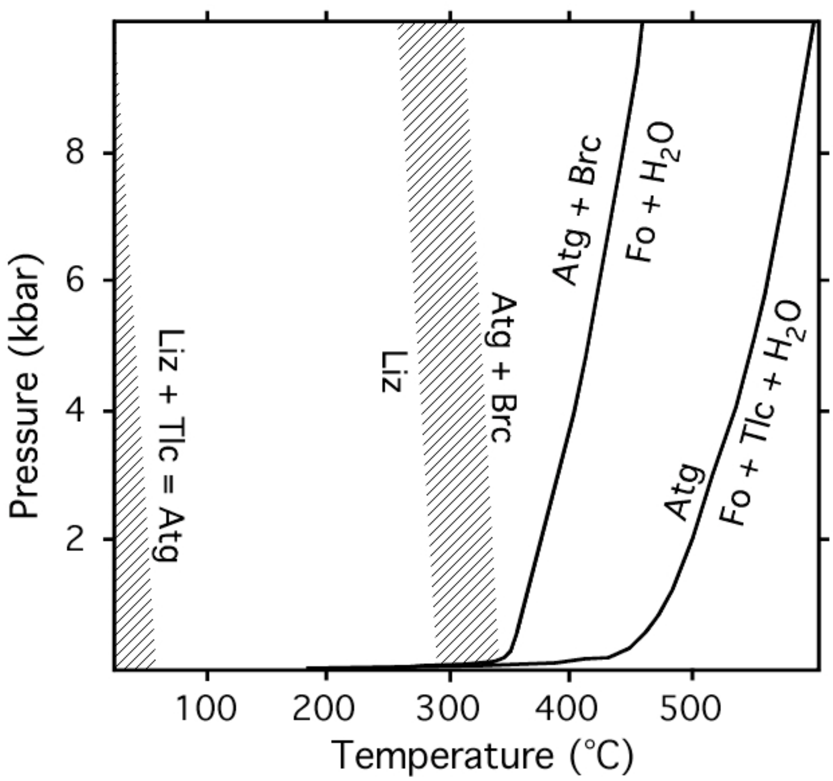


Figure 1.10: P-T diagram for serpentine minerals (modified from Evans, 2004). Shaded areas show uncertainty in location of reactions. Liz = lizardite, Tlc = talc, Atg = antigorite, Brc = Brucite, Fo = Forsterite.

volume of the affected rocks (O'Hanley, 1992). In many examples the center of a rock mass is partially serpentinized, or not serpentinized at all, because less water has reached it. The differential serpentinization and partial changes in volume from the exterior to the interior of the rock create a kernel pattern in which the core is less serpentinized and the rim is filled by serpentine veins and fractures (Figure 1.11; O'Hanley, 1992). Thus, these changes create heterogeneities defined by the varying degree of serpentinization throughout the rock.

Serpentinite formation and emplacement processes have been studied in different geologic settings (e.g. O'Hanley, 1996; Oakely et al., 2007). Serpentinization may occur at slow-spreading oceanic ridges and especially along ridge-transform faults (Aumento and Loubat, 1971; Hébert et al., 1990; Charlou et al., 1998). Serpentinite bodies generally are emplaced during the obduction of ophiolites where buoyant oceanic lithosphere thrusts onto the overriding plate (O'Hanley, 1996; Wakabayashi and Dilek, 2003; Figure 1.9a). If the ophiolite was emplaced as part of a mélange, then pieces of different lithologies may be broken up and incorporated into the mass that is obducted (Figures 1.9b, and c). Serpentinization can also take place in peridotite xenoliths within basalt, in ultramafic intrusions, and kimberlite deposits (O'Hanley, 1996; Stripp et al., 2006). Dehydration of slabs subducting beneath the forearc and water flowing through fractures in an extended forearc can partially serpentinize the mantle wedge causing serpentinite mud diapirs (Oakley et al., 2007). Serpentinite mud may form from grain-size reduction of massive serpentinite during faulting underneath the forearc. Serpentine mud diapirs has been described from the forearc of the Marianas Trench (Fryer et al., 1985; Figures 1.9d, and e). During diapirism, serpentinite rises vertically due to differences in density between the serpentinite and the overlying rock (Boillot et al., 1980; Reston et al., 2001).

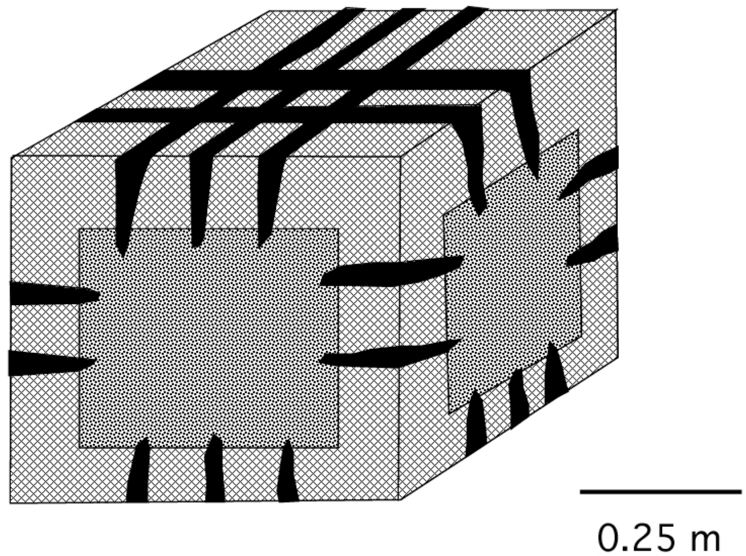


Figure 1.11: Kernel pattern in which the core is surrounded by a more serpentinized rim, veins, and fractures produced by differential serpentinization (modified from O'Hanley, 1992). Cross-hatched pattern represents serpentinized rim. Pattern with black squares represents unserpentinized core. Black bands represents fractures.

If serpentinite crops out, it is prone to break apart, and slump downslope forming debris flows formed mostly of serpentinite clasts (Lockwood, 1971).

1.4 ORGANIZATION OF THIS DISSERTATION

This dissertation is organized into main chapters (2, 3, and 4) that are essentially research articles to be submitted for publication in peer-reviewed journals. Chapter 2 looks at the microscale structures and textures that may improve our understanding of the tectonic history of the peridotite and serpentinite through recognition of deformation mechanisms and serpentinization processes. Chapter 3 analyzes the kinematics of shear planes within the internal structure of the serpentinite to try to decipher the strain evolution. Chapter 4 integrates the serpentinite field relations with Late Cretaceous rocks at their contacts and regional deformation and develops a tectonic model at the regional scale. Conclusions resulting from this dissertation and suggestions for future work are presented in Chapter 5. Appendix A details the shear plane data for all structures measured and used for Chapter 3. Appendix B shows petrographic descriptions for thin-sections used in Chapter 2.

2.0 MICROSTRUCTURES AND TEXTURES OF ULTRAMAFIC ROCKS IN WESTERN PUERTO RICO

2.1 INTRODUCTION

Serpentinite in Puerto Rico is one of the oldest rocks at the Caribbean-North American plate boundary zone (Schellekens, 1998; Figure 2.1a). It is locally part of serpentinite mélange that includes pieces of Early Jurassic to Cretaceous chert, amphibolite, metabasalt, schist, gneiss, and greenstone (Mattson, 1960; Montgomery et al., 1994a; Schellekens, 1998). Exposed serpentinite occupies approximately 140 km^2 in southwestern Puerto Rico within three belts: 1) Monte del Estado, 2) Río Guanajibo, and 3) Sierra Bermeja (Mattson, 1960; Figure 2.1b). Mattson (1973) proposed that Sierra Bermeja, the southernmost belt, is a serpentinite mélange that was emplaced as a northward directed (present coordinates) thrust nappe in Early Cretaceous time. According to Mattson (1960) and Mattson and Schwartz (1971), folding of serpentinite and Late Cretaceous rocks during the Maastrichtian was followed by diapirism that continued to move the serpentinite upwards, and in some places subhorizontally over Late Cretaceous rocks. The mineralogical composition of the serpentinite in the Río Guanajibo and Monte del Estado is mostly chrysotile and lizardite (Hess and Otalora, 1964; Curet, 1981) that formed from an ultramafic protolith composed of harzburgite, dunite, and lherzolite (Mattson, 1964; Schwartz, 1970; Curet, 1981).

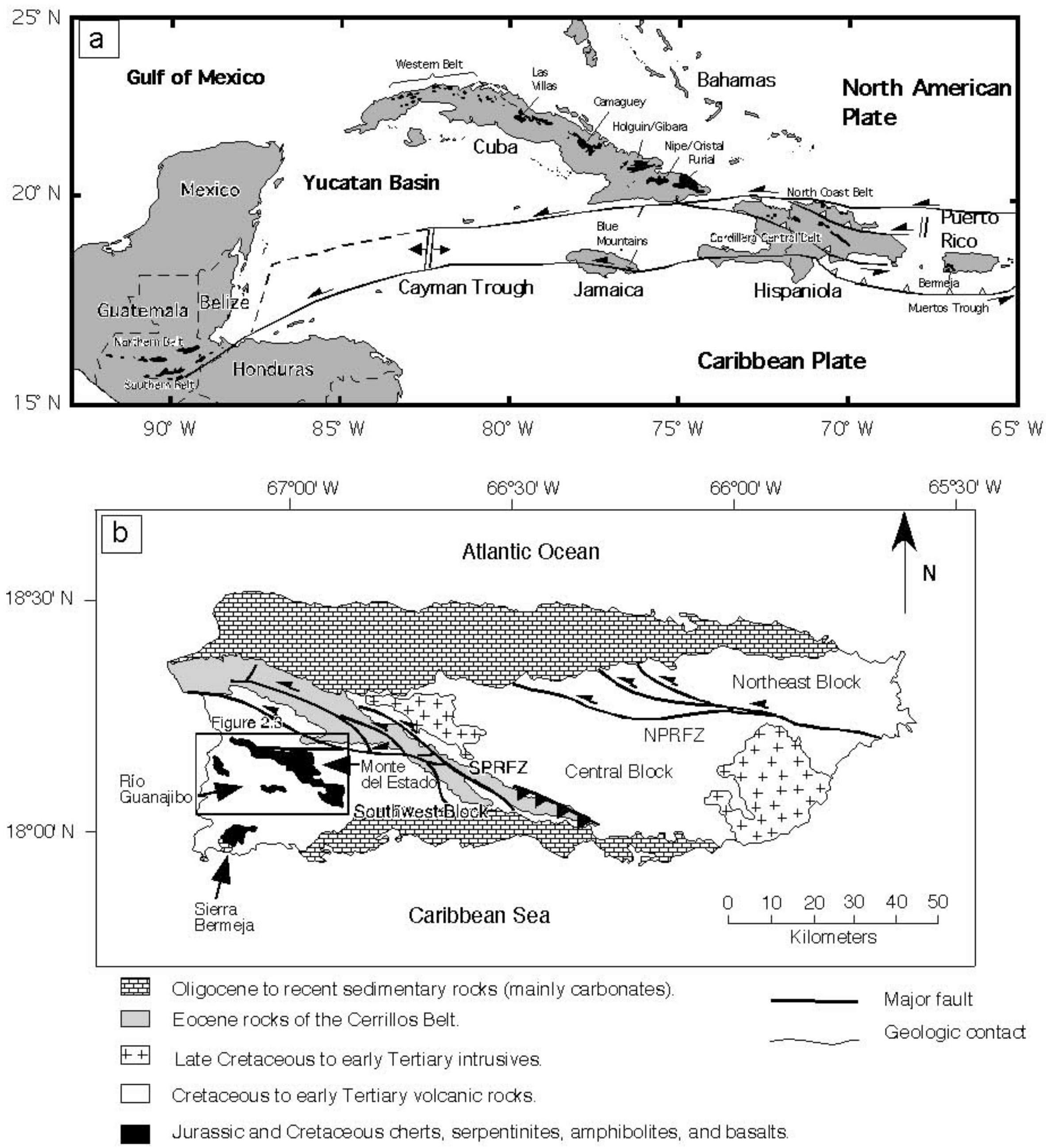


Figure 2.1: a. Tectonic setting of the northern plate boundary zone between the Caribbean and North American plates showing the distribution of ultramafic rocks including serpentinite (modified from Wadge et al., 1984). b. Generalized geologic map of Puerto Rico showing location of serpentinite bodies and major fault zones. The Southern Puerto Rico Fault Zone (SPRFZ) and the Northern Puerto Rico Fault Zone (NPRFZ) separate the island into three blocks (modified from Monroe, 1980).

Amphibolite, schist, metabasalt, and chert are the most abundant rocks in Sierra Bermeja (Schellekens, 1998).

General studies have described stratigraphic, structural, and petrophysical relationships of the serpentinite (Mattson, 1960; Burk, 1964). However, no detailed microstructural analyses have been done. This study aims to fill this gap and focuses upon microscopic textures and microstructures from the Monte del Estado and Río Guanajibo bodies. The information may be used to interpret environmental conditions during serpentinization and subsequent deformation. Thus, this study provides additional data and insights that bear upon the tectonic evolution of southwest Puerto Rico and the Caribbean-North American plate boundary zone.

2.2 GEOLOGY OF PUERTO RICO

Puerto Rico is composed mostly of Cretaceous to Eocene volcanic rocks, limestone, and intrusions (Figure 2.1b). Early Jurassic to Late Cretaceous chert and ultramafic rocks crop out in the southwestern part of the island whereas late Tertiary limestone strata with gentle dips mantle the northern and southern coasts (Montgomery, et al., 1994a, Larue, 1994). The northwest-striking Northern Puerto Rico and Southern Puerto Rico fault zones separate Puerto Rico into structural blocks (Figure 2.1b; Glover, 1971). Late Cretaceous and early Tertiary sedimentary and volcanic rocks are deposited on top of the serpentinite.

2.3 OVERVIEW OF TEXTURES AND MICROSTRUCTURES

2.3.1 Peridotite textures and microstructures

2.3.1.1 Crystallization

Harte (1977) classified peridotite on the size and shape of olivine crystals. Coarse texture is defined by crystals with uniform average size greater than 2.0 mm and absence of porphyroclasts. Porphyroclastic texture is characterized by two populations of crystals: 1) porphyroclasts that makes up more than 10 % of the olivine, and 2) fine-grained matrix. The mosaic-porphyroclasts texture contains porphyroclasts in which less than 10 % are olivine. Granuloblastic texture is defined by a small crystal size and porphyroclasts are absent or rare. Mercier and Nicolas (1975) suggest that rock with coarse texture records old and weak deformation. Granuloblastic texture records dynamic recrystallization under strong deformation. Porphyroclastic texture records the transition between the coarse and recrystallized textures.

2.3.1.2 Deformation textures

Suhr (1993) divided microstructures in peridotite in two groups: 1) microstructures, such as coarse olivine with flat optical extinction and sharply defined grain boundaries, that formed at high temperatures (1200-1300°C) and low stress conditions, and 2) microstructures, which contain fine-grained olivine neoblasts, porphyritic texture, subgrain boundaries, and undulose extinction that develop at lower temperatures (900-1000°C) and deviatoric stress conditions. Ceuleneer et al. (1988) and Nicolas (1986) suggest that these microstructures formed in the asthenosphere and lithosphere, respectively. Pyroxene foliation and lineation commonly form at deviatoric stress conditions.

2.3.2 Serpentinite textures and microstructures

Serpentinite that forms by the hydration of peridotite in the lithosphere at temperatures below 600°C (Figure 2.2; Hess, 1964; Evans, 2004) contains three main minerals: lizardite, chrysotile, and antigorite. Lizardite is stable at low temperatures (50 to 300°C), antigorite is stable at high temperatures (350 to 600°C), and chrysotile is metastable (Evans, 2004). It is common that all three serpentine minerals are present in serpentinite. However, the presence of mainly lizardite or mainly antigorite provide clues to part of the thermal history which the rock records (Norrell et al., 1989; O'Hanley, 1996).

2.3.2.1 Textures due to serpentinization

New textures form during deformation and serpentinization of peridotite. Maltman (1978) described serpentinite textures as mesh texture, ribbon texture, and bladed mat. Mesh texture consists of cores and cords (long strands) in which the cores represent the center of serpentinized olivines and the cords represent the serpentinized grain boundaries or fractures (Wicks, 1984). Ribbon texture is characterized by a series of broad, elongate, and parallel cords with preferred orientation. Bladed mat texture shows complete replacement of pre-existing structures by an intergrowth of tiny blades. Wicks and Whittaker (1977) defined three main serpentinite textures: 1) pseudomorphic, 2) non-pseudomorphic, and 3) intermediate. The shapes of olivine and pyroxene crystals are preserved in the pseudomorphic texture and may contain relicts. Serpentine after olivine shows a mesh and hourglass textures, and pseudomorphs of pyroxene and amphibole that are called bastites (Wicks and Whittaker, 1977). Non-pseudomorphic textures do not preserve the shape of the original minerals and form through the recrystallization of pseudomorphic serpentine textures or through the serpentinization of primary

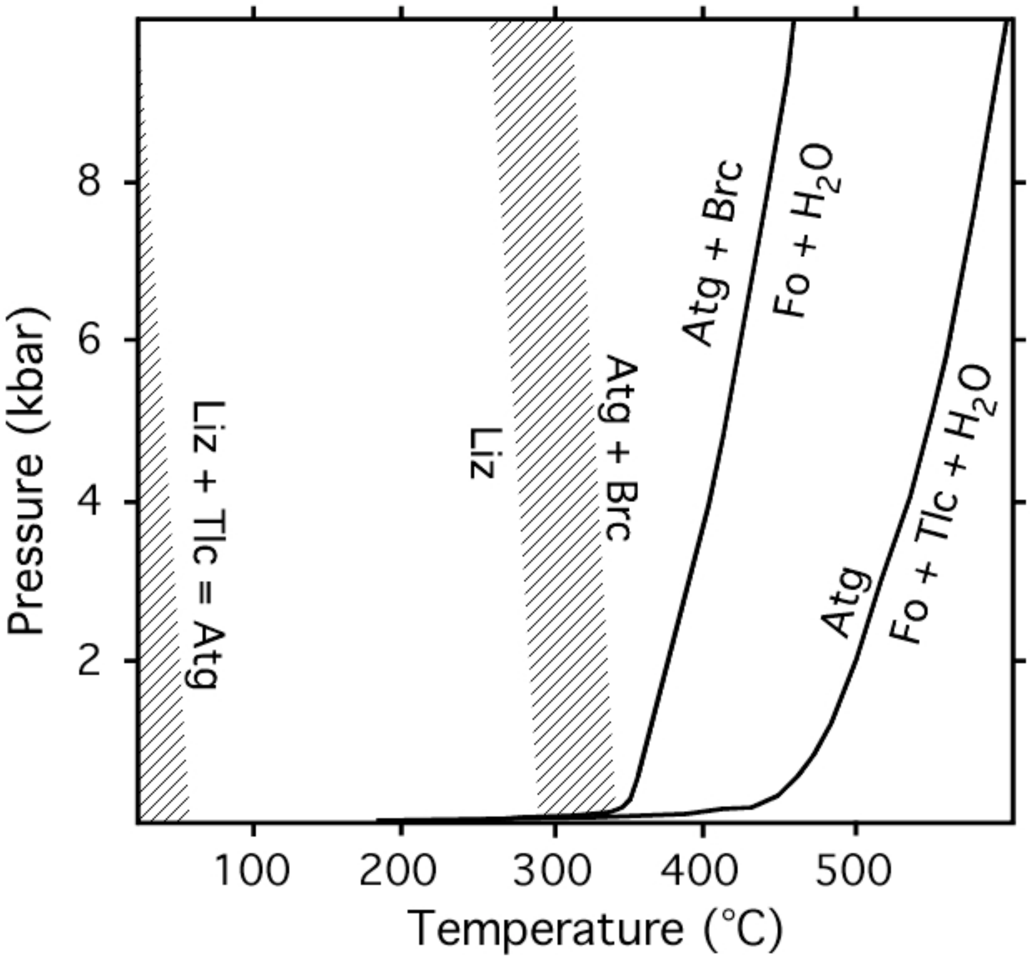


Figure 2.2: P-T diagram for serpentine minerals (modified from Evans, 2004). Shaded areas show uncertainty in location of reactions. Liz = lizardite, Tlc = talc, Atg = antigorite, Brc = Brucite, Fo = Forsterite.

olivine, pyroxene, and amphibole. The orientation of the serpentine grains may vary from random to strongly subparallel orientation (Wicks and Whittaker, 1977). Non-pseudomorphic texture can be subdivided into interpenetrating and interlocking textures. Interpenetrating texture, commonly composed of antigorite, consists of elongate blades that form a cross-cutting fabric, and interlocking texture comprises irregular, equant, sometimes spherulitic grains of serpentine (Wicks and Whittaker, 1977). Intermediate textures have characteristics of both pseudomorphic and non-pseudomorphic textures.

2.3.2.2 Deformation textures

Textures due to deformation after serpentinization include brittle structures such as fractures, veins, and faults, gouge, and ductile structures such as serpentine foliation, S-C fabrics, and mantled porphyroclasts (e.g. Wicks, 1984; Norrell et al., 1989; O'Hanley, 1996). Phacoidal texture is common in serpentinites. It consists of lenses of serpentinite that are surrounded by serpentine foliation. Striations may occur at the sides of the lenses indicating that slip has occurred along the foliation planes. Serpentinite deformed by brittle deformation preserve may preserve pseudomorphic textures. In ductilely deformed serpentinite, non-pseudomorphic textures are common, especially in serpentinite mylonite where serpentine crystals are elongated and mostly consist of antigorite blades (Norrell et al., 1989). Mantled porphyroclasts of bastite, magnetite, and spinel may occur in serpentinite mylonites (Norrell et al., 1989).

2.3.3 Micro-scale studies of serpentinite in Puerto Rico

Thin-section studies of serpentinized dunite and harzburgite, conducted from the AMSOC core in the Río Guanajibo body of southwestern Puerto Rico, reveal olivine, orthopyroxene, and clinopyroxene replaced by a mesh or fibrous texture composed of serpentine as well as olivine relics (Mattson, 1964; Lapham, 1964; Hess and Otalora, 1964). Thin clinopyroxene exsolution lamellae and inclusions are common in orthopyroxenes (Mattson, 1964; Lapham, 1964). Magnetite, chromite, and Mg-Al spinel are also common in the opaque minerals (Lapham, 1964). X-ray analysis shows that chrysotile and lizardite are the main serpentine minerals in the core (Hess and Otalora, 1964). No antigorite was identified. Brucite and hydrogrossularite are present in small quantities (Hess and Otalora, 1964). McIntyre (1975) and Curet (1981) described clasts and matrix of serpentinite at the contacts of Monte del Estado with Yauco Formation. They interpreted the matrix-supported, poorly sorted, angular to sub-rounded clasts, which constitute up to 60 % of the rock, as a sedimentary deposit.

2.4 METHODS

Samples were collected from 45 locations throughout the Monte del Estado and Río Guanajibo serpentinite bodies for microstructural analyses (Figure 2.3). 122 thin sections were made from 78 samples. Samples were grouped into serpentinized peridotite, sheared serpentinite, and serpentinite breccia. Thin sections were analyzed for textures (formed in peridotite, of serpentinization, and sedimentary), mineral identification, brittle, and ductile deformation mechanisms using an optical microscope. Cross-cutting and serpentinization relationships were noted. Representative textures of all the thin-sections are described below.

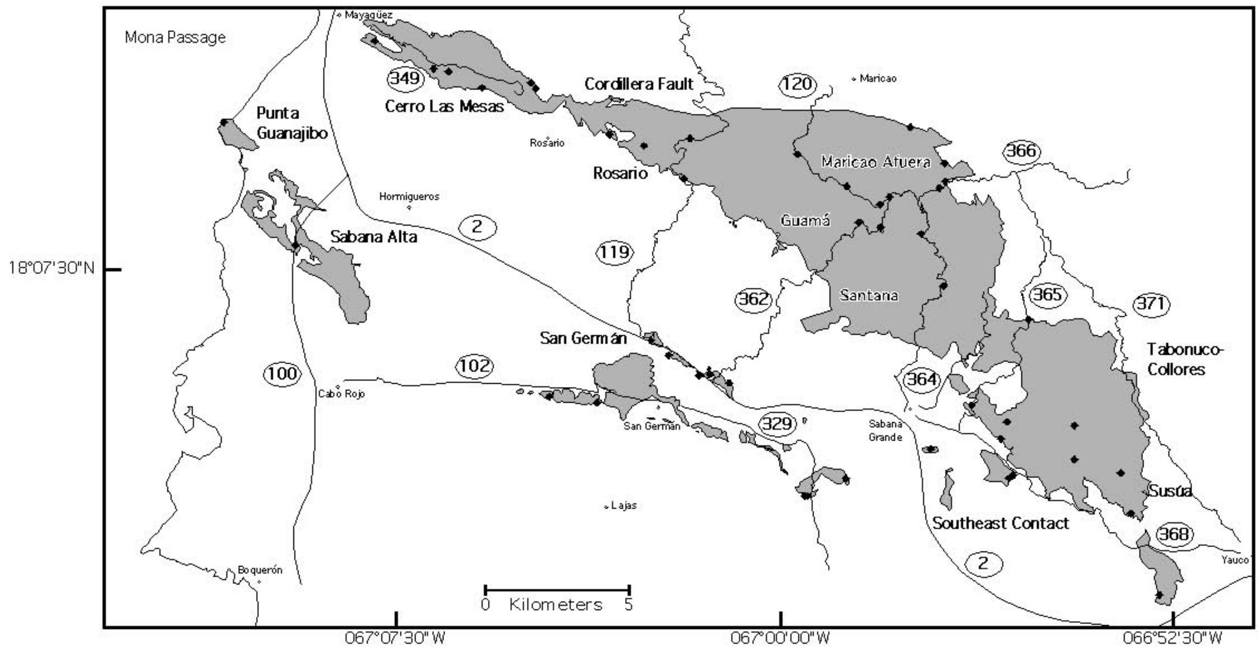


Figure 2.3: Map showing sample collection sites in the Monte del Estado and Río Guanajibo serpentinite. Numbers inside ovals indicate road numbers. Map of serpentinite is adapted from Curet (1986), Volckmann (1984b; 1984c), McIntyre (1975), Martínez-Colón (2003), and Llerandi Román (2004).

2.5 RESULTS

2.5.1 Serpentinized Peridotite

Harzburgite is the most common peridotite in the thin-sections (73%), although lherzolite (23%) and dunite (4%) are also present. Olivine, orthopyroxene, clinopyroxene, and spinel constitute the primary minerals of the peridotite from the study area. Relict and serpentinized olivine is 0.05-3 mm with an average of 0.2 mm in its long axis. Relict grains and grain outlines occupy about 74% of the average thin-section and about 94% is serpentinized. Morphology varies from euhedral to anhedral but in most of the samples it is anhedral. In granuloblastic textures, 120° grain boundaries and recrystallized olivine are preserved (Figure 2.4a). Fractures are present in olivine phenocrysts.

Bastite grains after orthopyroxene are between 0.1-10 mm long with an average length of 1 mm. Bastite is present in about 13% of the average thin-section in which 91% of the grains are serpentinized. Crystal shape varies from subhedral-anhedral, but anhedral crystals predominate. Exsolution lamellae occur within the orthopyroxenes. Only 1 % of clinopyroxene crystals, which are slightly more resistant to serpentinization than orthopyroxene, are serpentinized. Size of crystals ranges from 0.1-4 mm with an average of 0.4 mm. Generally, only 5% of the crystals are clinopyroxene in the thin-section, and only 38% of the thin sections contain clinopyroxene. Clinopyroxene is mostly anhedral and acicular, although subhedral grains occur.

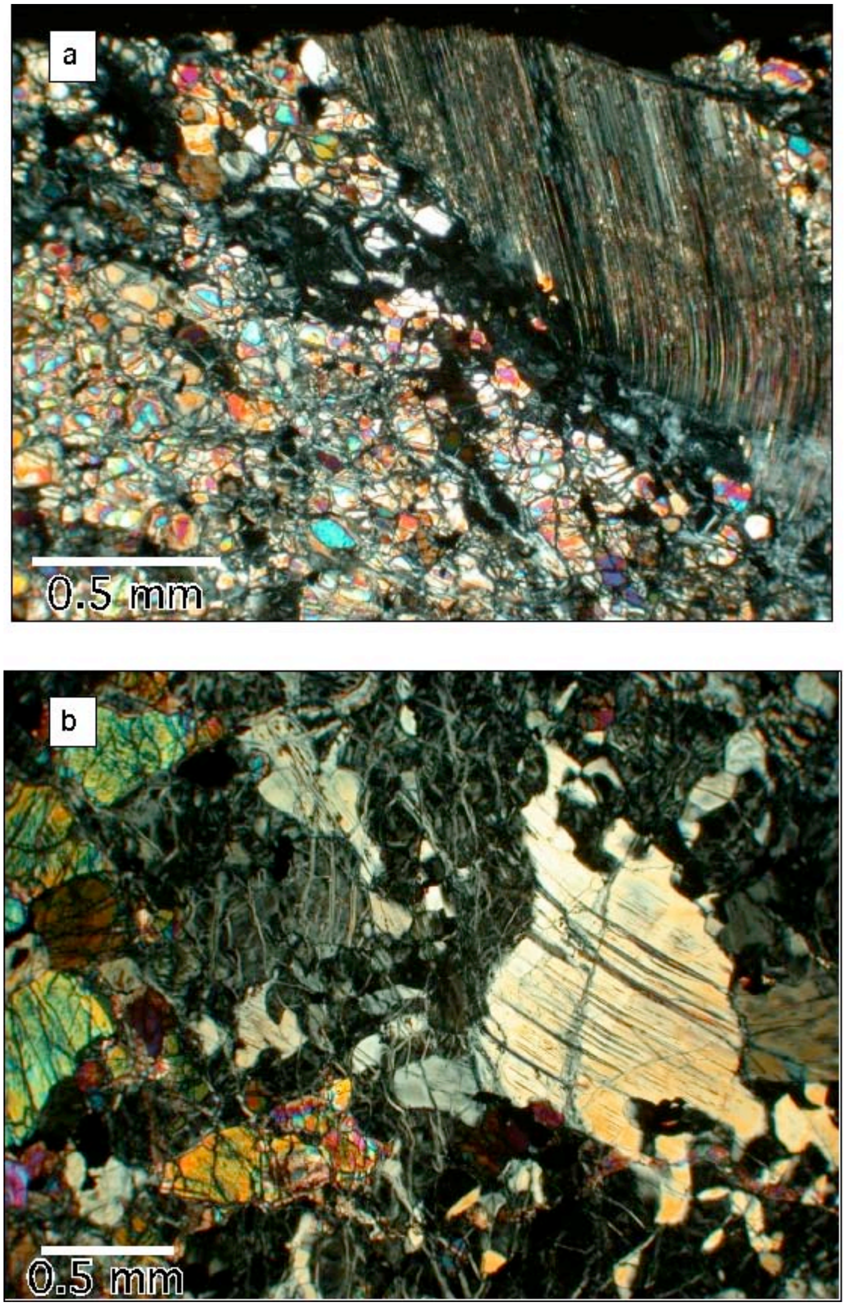
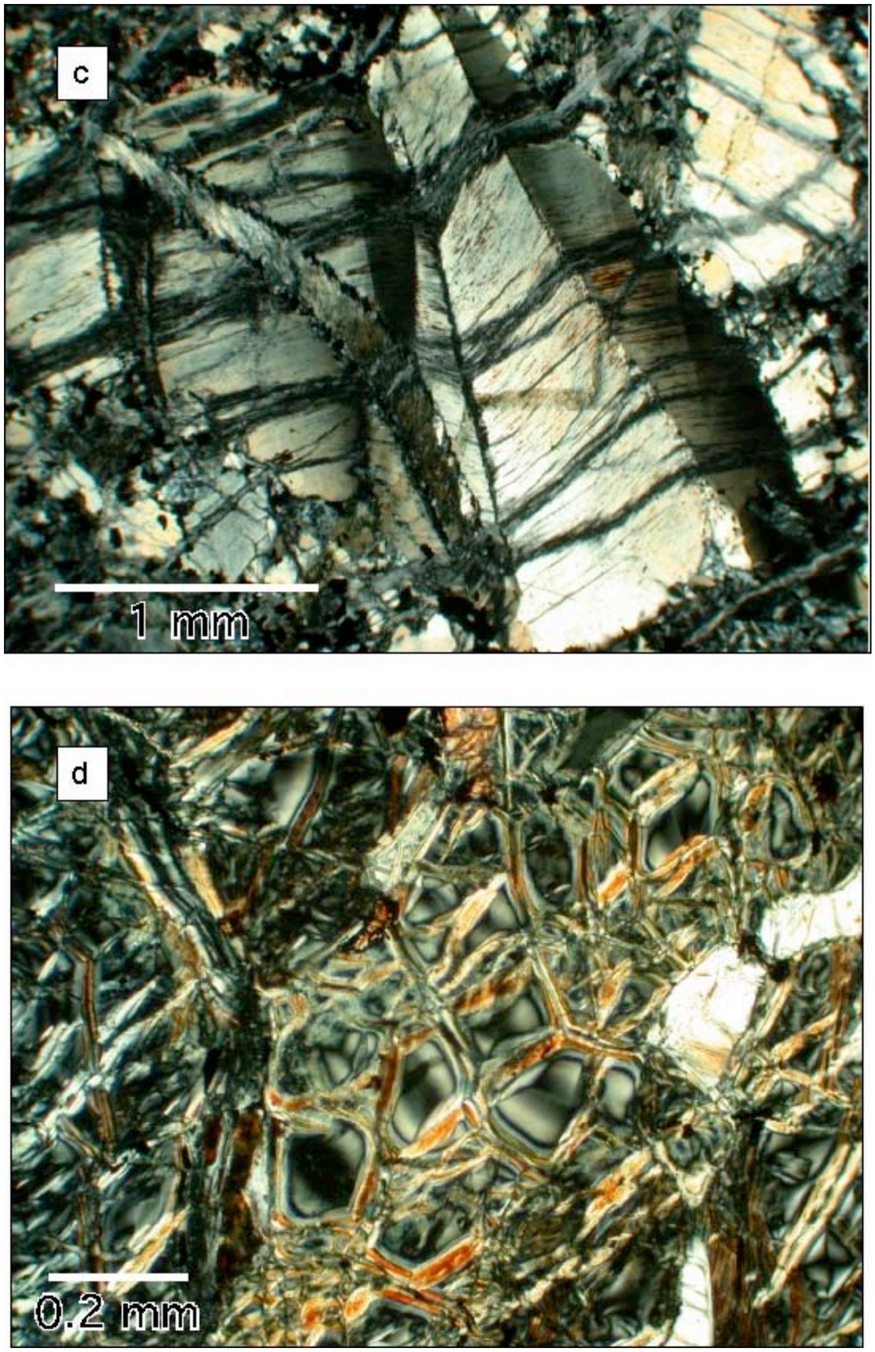


Figure 2.4: Cross-polarized light photographs of serpentinized peridotite. a. Relict olivine and bent bastite. b. Porphyritic texture with relict strained coarse olivine and coarse kinked bastite showing exsolution lamellae of clinopyroxene. Mesh texture surrounds coarse grains. c. Kinked bastite porphyroclast. d. Mesh texture with core surrounded by chords. e. Elongated cores and chords forming Ribbon texture. f. Fine crystal blades in interpenetrating texture.



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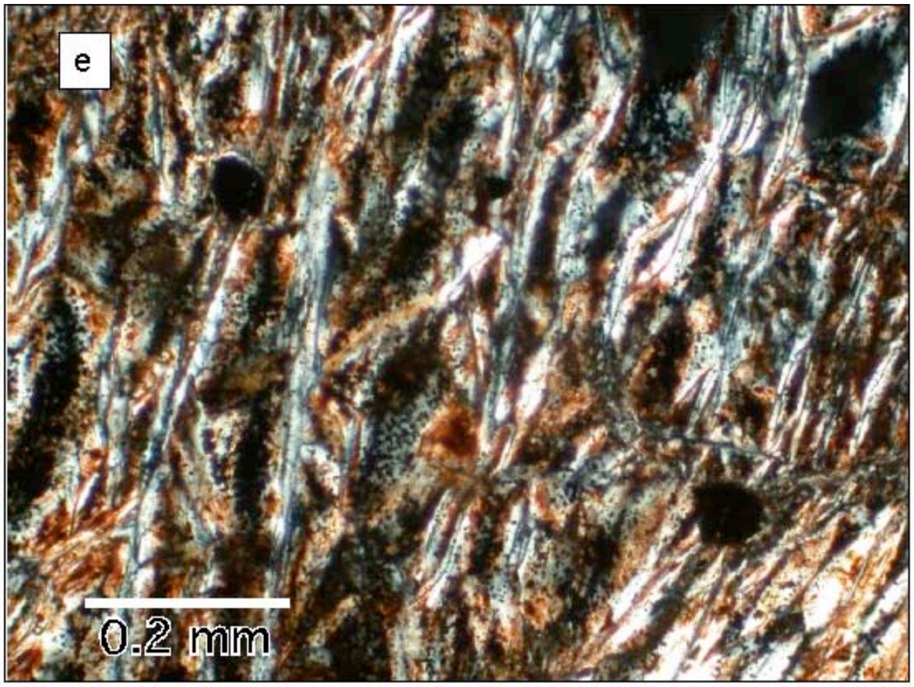

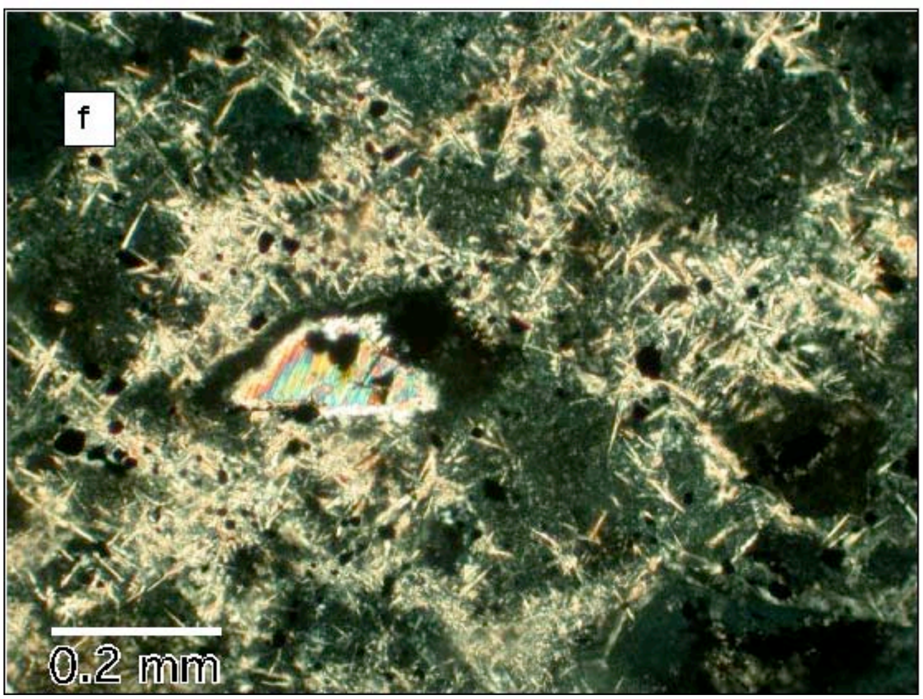

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Opaque minerals such as spinel and magnetite occupy about 8% of the average thin-section although they occur in all specimens. Sizes range from 0.05-2 mm with an average of 0.2 mm. Magnetite has anhedral morphology and occurs at grain boundaries, fractures, cleavage planes, cores, and rims of serpentine. About 28% of the opaque minerals are altered to red-brown hematite. Spinel occurs as subhedral grains that are not affected by serpentinization. Magnetite is a secondary mineral that forms during serpentinization as suggested by its location where it crystallizes along grain boundaries (O'Hanley, 1996). In places, magnetite aggregates define compositional foliation along grain boundaries. Other secondary minerals include talc and amphibole in veins and replacing serpentine in small quantities.

Evidence for crystal-plastic deformation is preserved in olivine, bastites, and platy serpentine. Recrystallization of olivine is indicated by the presence of neoblasts around porphyroclasts, 120° grain boundaries, and undulose extinction. Bastite shows undulose extinction, kinking, subgrains and deformation bands (Figure 2.4c). Bastite foliation and lineation is defined by alignment of long axes of bastites. Some of the serpentine ribbon texture is defined by aligned bastite that marks foliation. Platy serpentine also shows undulose extinction. Overlapping mesh rims indicate serpentine recrystallization and replacement is suggested by a change from mesh texture to interlocking texture in cores and bastite (Figure 2.4f). Some serpentinized olivine has deformation lamellae and is kinked.

Fractures and serpentine veins cut serpentinized olivine, bastite, and textures (Figure 2.4c). Veins have spherulitic and fibrous chrysotile textures and may be kinked and sheared. Cross-cutting relationships between serpentine veins indicate various episodes of brittle deformation. Serrate veins indicate transitional textures.

Serpentinized peridotite is characterized by the pseudomorphic texture in which outlines and crystals of relict olivine and pyroxene are preserved (Figure 2.4). Although serpentinization destroys evidence of strain within olivine, strain in pyroxene is preserved. Preexisting granuloblastic and porphyroclastic textures in olivine, and more commonly porphyroclastic pyroxene characterize the serpentinized peridotite from the study area (Figure 2.4a). Serpentinization creates mesh (Figure 2.4d) and hourglass textures in the rock. In places the mesh texture is stretched and forms a ribbon texture (Figure 2.4e). Interlocking and rarely interpenetrating textures replace mesh texture in some of the samples indicating a transition from pseudomorphic to non-pseudomorphic textures (Figure 2.4f).

2.5.2 Sheared Serpentinite

Non-pseudomorphic textures and S-C fabrics that show sense of movement characterize sheared serpentinite. Some serpentine textures are transitional. Of the non-pseudomorphic textures, the interlocking texture is more common than the interpenetrating texture. In places, elongated remnants of mesh and ribbon textures occur within foliated non-pseudomorphic serpentinite. Porphyroclastic bastites are common within foliated serpentinite.

Olivine and pyroxene that are 98-100 % serpentinized, and magnetite and spinel comprise the main minerals in the sheared serpentinite. Olivine is altered to anhedral, elongate, platy, and bladed serpentine occupies about 77% of the average thin-section and its size varies from 0.05 to 4 mm with an average of 0.2 mm. Bastite has anhedral morphology and occupies about 9% of the average thin-section, lower percentage than samples with pseudomorphic texture. Size ranges from 0.05-15 mm with an average of 0.6 mm. Magnetite and spinel comprise the opaque minerals and occupy about 9% of the thin-section. Of this only 6% is altered to hematite. Grains vary from 0.05 to 2 mm with an average of 0.2 mm. Magnetite accumulates along faults, C-planes, and grain boundaries.

Foliation in the non-pseudomorphic serpentinite is commonly folded and defined by elongate bastite, blades of serpentine, and magnetite grains (Figure 2.5a). Elongate bastite grains, which show undulose extinction are kinked, bent, and folded (Figure 2.5b and 2.5c). S-C fabric is pervasive throughout foliated serpentinite (Figure 2.5d). S-planes are defined by aligned bladed serpentine common in antigorite. Aligned serpentine crystals and fractures define C-planes. Interlocking serpentine texture replaces pseudomorphic texture in large crystals, whereas interpenetrating texture replaces interlocking and pseudomorphic textures. Spherulitic serpentine fibers and veins cut pseudomorphic textures, and faults cut serpentine veins. Elongate masses of less deformed serpentinite are aligned with foliation. Interlocking serpentine texture is preserved in clasts that have not been affected by shearing. Serpentinite, bastite, spinel, and magnetite grains may form mantled porphyroclasts within the sheared serpentinite (Figures 2.5c and 2.5e). This crystal-plastic deformation indicates that some sheared serpentinite are mylonite. As noted by Norrell et al. (1989), antigorite is the main serpentine mineral in serpentine mylonite.

2.5.3 Sedimentary rocks composed of serpentinite and other lithologies

Sedimentary rocks within and at the contacts of the serpentinite belts include breccia, conglomerate, and sandstone. Most of the sediments within these rocks are serpentinite in which 50% of the rock is matrix. About 16% of the rock is serpentinite or serpentine clasts. Minimum size is 0.08 mm, maximum size is 3 mm, and the average size is 0.2 mm. Bastite composes about 9% of the clasts. Size varies from 0.1 to 7 mm with an average of 0.5 mm. One of the

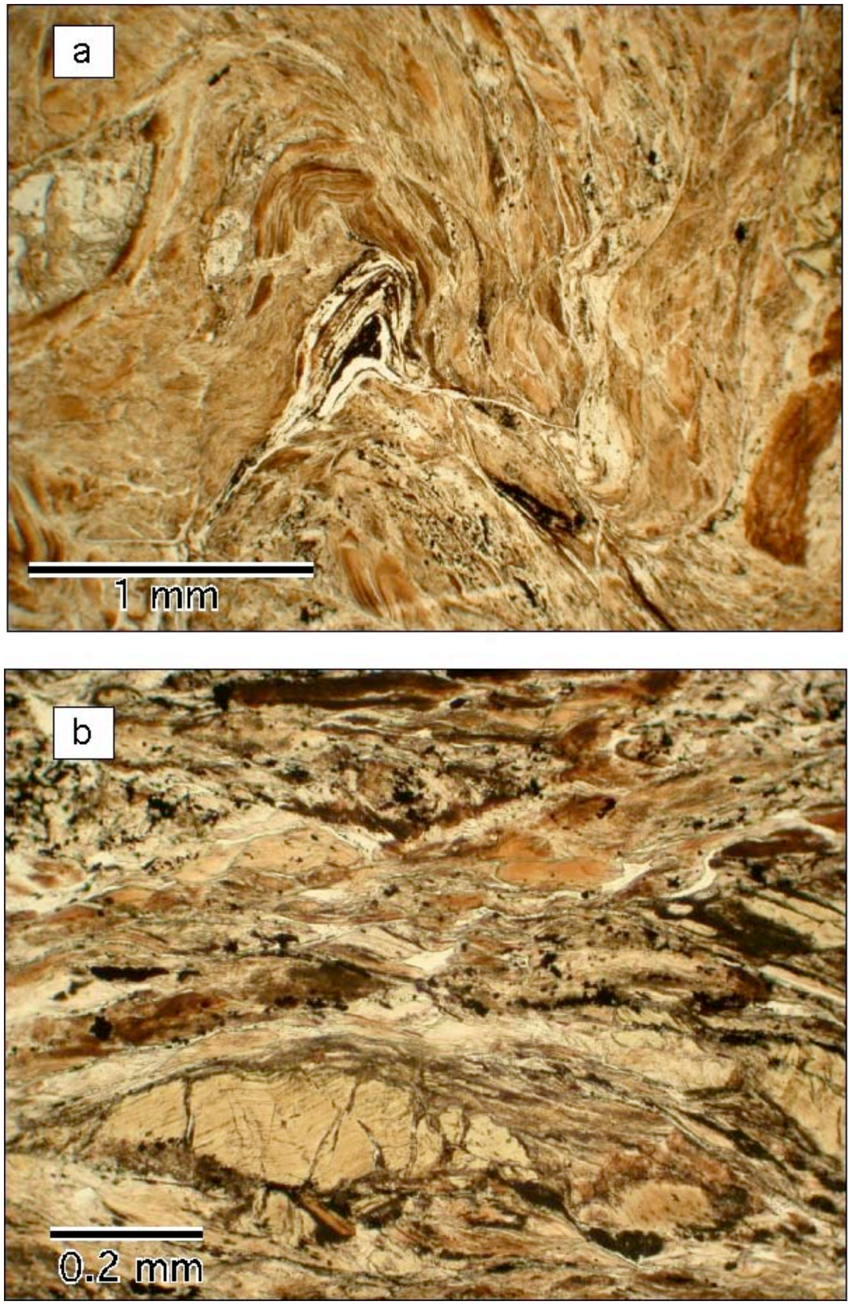
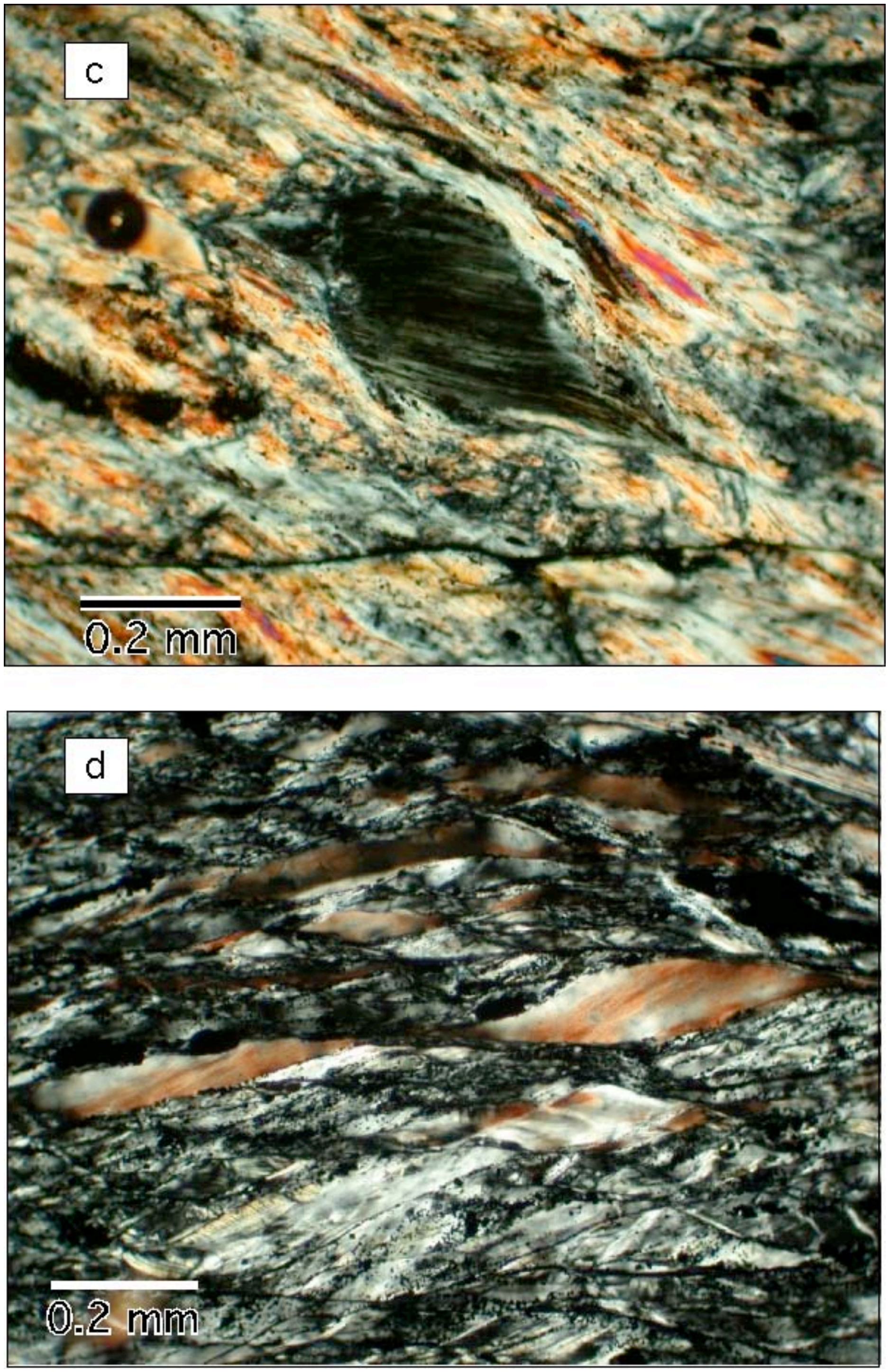


Figure 2.5: Microphotographs of sheared serpentinite. a. Folded serpentine foliation in plane-polarized light. b. Elongated and kinked bastite aligned with foliation. c. Bastite porphyroblast in cross-polarized light. d. S-C fabrics in serpentine under cross-polarized light. e. Foliated serpentine and mantled spinel under plane-polarized light. f. Serpentine porphyroblasts under plane-polarized light.



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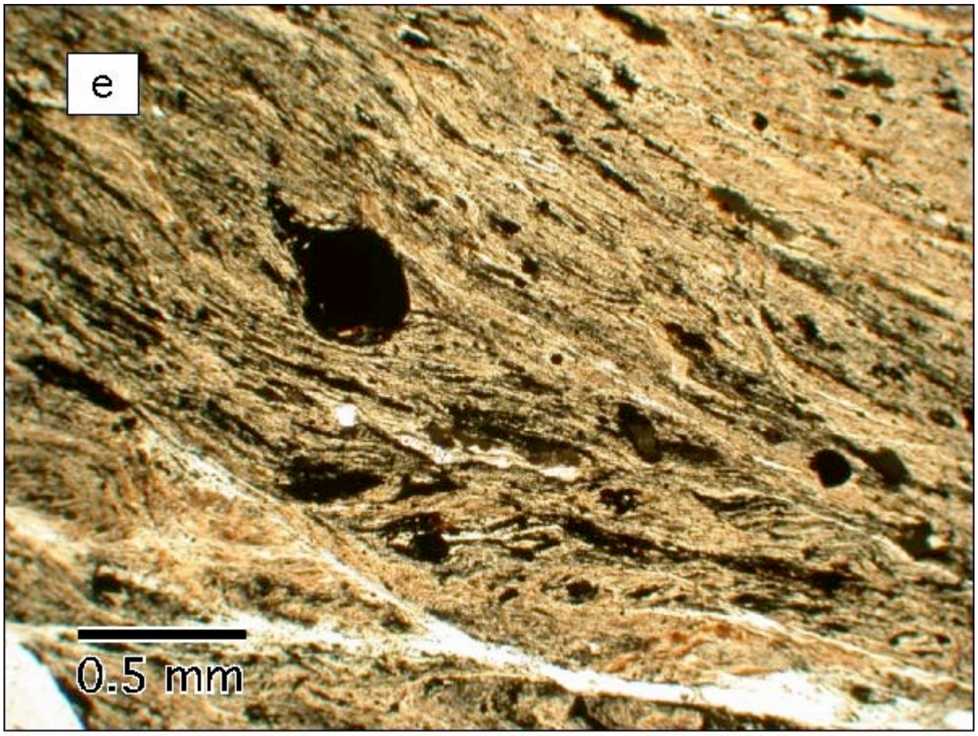

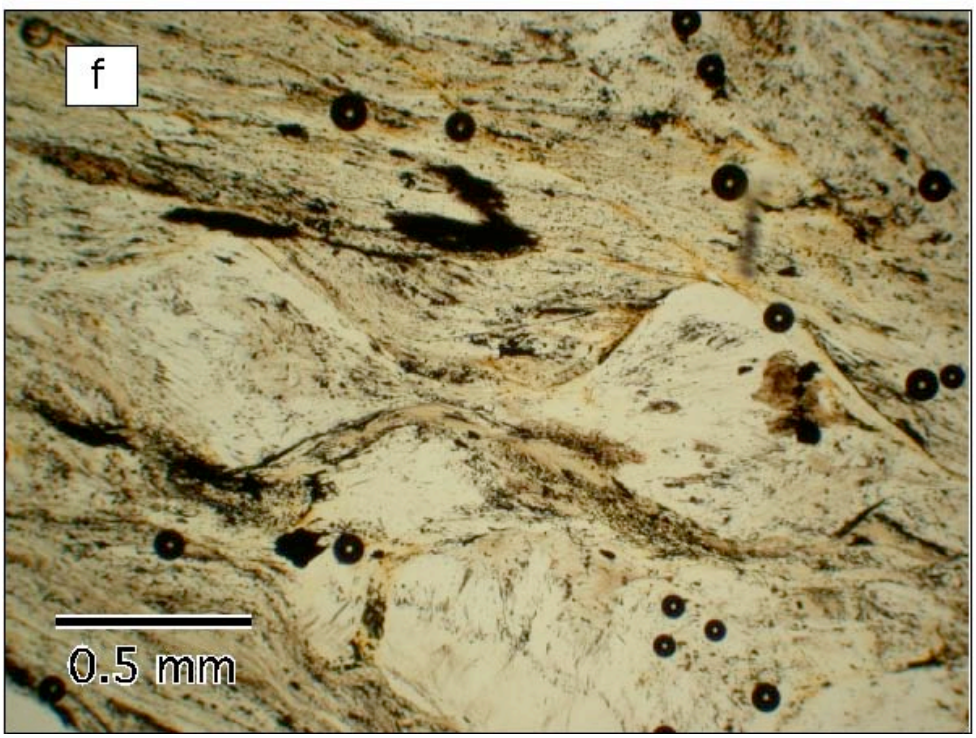

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thin-sections had 20% of the rock being calcite clasts that range from 0.1 to 3 mm with an average of 0.5 mm in length. Secondary minerals such as magnetite, calcite, amphibole, talc, and chlorite also occur but on limited quantities. Magnetite occurs in about 7% of the average thin-section, and calcite, amphibole, talc, and chlorite comprise 3% of the average thin-sections. All of these clasts are angular and/or anhedral (Figure 2.6). Matrix composed of serpentine comprises on average 50% of the rock and in some samples clay comprises about 28% of the sample.

Texture at the thin-section scale is characterized by poorly sorted, angular-subangular clasts, matrix-supported, massive breccia (Figure 2.6). A few samples show rounded-subangular clasts in a clast-supported framework. A sandstone is graded with layering defined by aligned clasts. Some clasts within the thin-sections are pebble size. Among clasts, pieces of serpentinite showing mesh, hourglass, ribbon, and interlocking textures are distinguished as well as pieces of spherulitic serpentine veins (Figure 2.6a). Bastite clasts show undulose extinction, kinks, subgrains, and faults. In one thin-section, serpentinite clasts are surrounded by a calcite matrix, and are cut by calcite veins (Figure 2.6c).

2.6 DISCUSSION

Microscale textures in the serpentinite reveal serpentinization and deformation histories of the peridotite. Olivine has a granuloblastic texture, except for rare samples where there is strained porphyroclastic olivine. Most olivine is equant, tabular, and in places shows polygonization with 120° grain boundaries. Generally bastite shows a porphyritic texture. These relationships indicate that the olivine was recrystallized as neoblasts that are strain-free fine-grained crystals

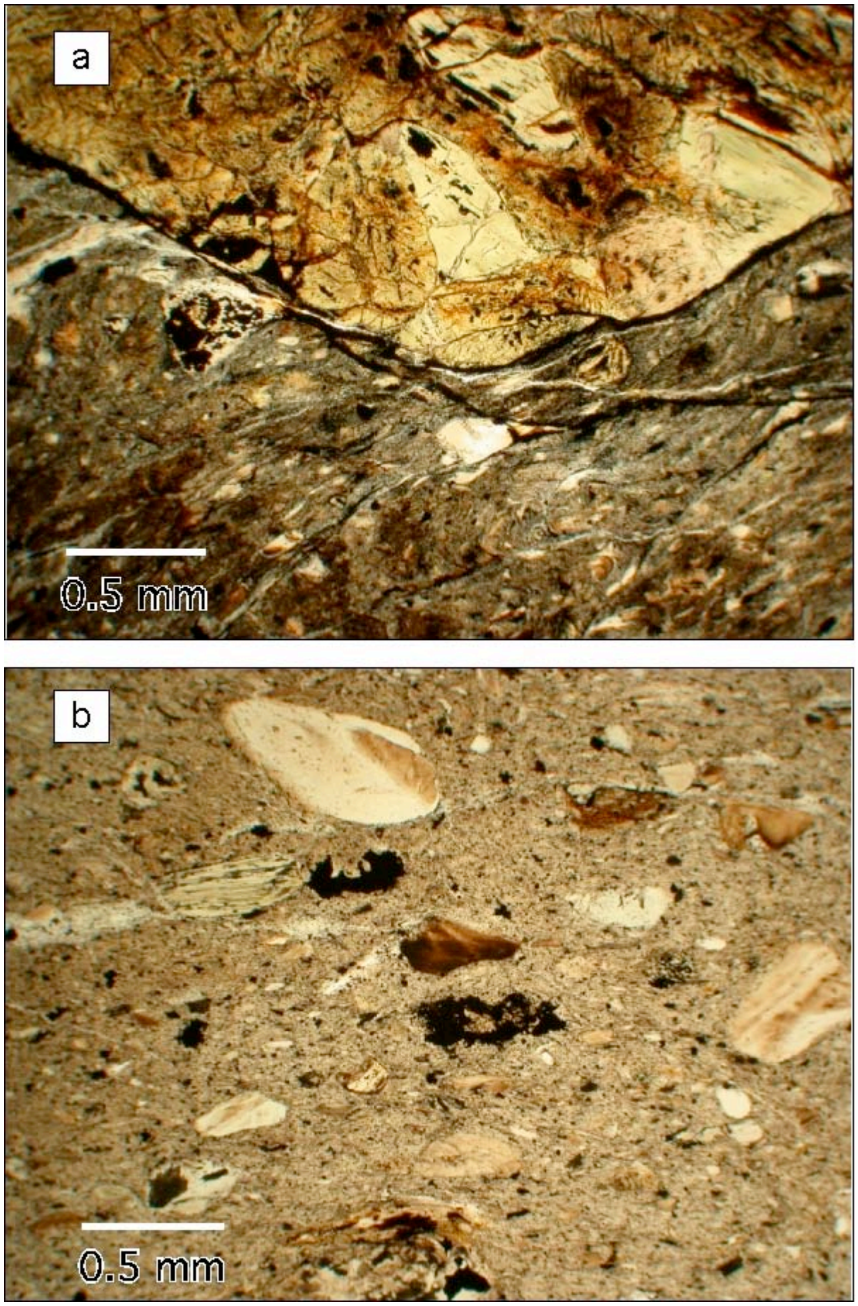


Figure 2.6: Photomicrographs of sedimentary rocks composed of serpentinite. a. Serpentinite pebble surrounded by fine-grained serpentinite matrix and clasts (plane-polarized light). b. Poorly sorted sandstone made of subparallel serpentinite clasts and matrix (plane-polarized light). c. Poorly sorted sandstone with predominantly serpentinite and calcite clasts in a serpentine matrix (cross-polarized light). d. Poorly sorted matrix of serpentinite conglomerate at southern contact of Monte del Estado. Matrix consists of serpentine, bastite, and lithics (plane-polarized light).

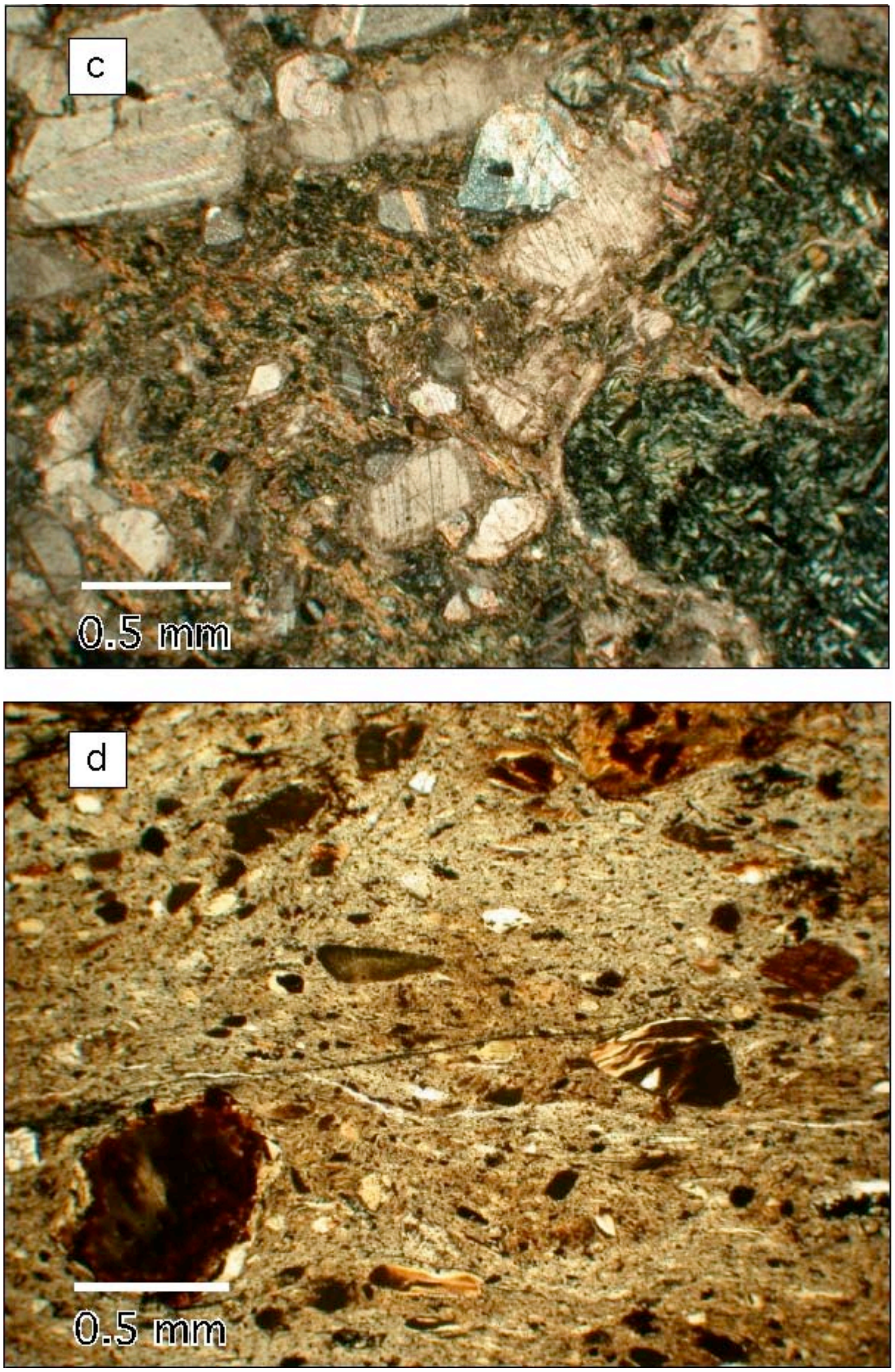


Figure 2.6 (continued)

that formed from larger strained crystals in a porphyroclastic texture (Mercier and Nicolas, 1975). Undulose extinction, kinking, subgrains, and deformation lamellae in bastites indicate intracrystalline deformation of peridotite prior to serpentinization. Foliation and lineation defined by aligned bastites crystals are also indicative of high temperature. Thus, most of the samples in the study area show evidence of pre-serpentinization plastic flow of peridotite at high temperature (900-1000°C) typical of the mantle according to estimates by Suhr (1993).

Serpentinization commonly starts along fractures around olivine grains and forms the distinctive mesh texture in which cores and cords are defined by lizardite and chrysotile serpentine minerals (O'Hanley, 1996). Serpentine replacement is common as suggested by the replacement of serpentine textures (pseudomorphic to non-pseudomorphic).

Deformation of serpentinized peridotite is shown by mylonite and foliation defined by elongated and aligned serpentine. Serpentinite mylonite is indicative of deformation of antigorite because antigorite is the only stable serpentine mineral at the conditions that form the mylonite (Norrell et al., 1989). If antigorite is the serpentine mineral in these mylonites, then it would have been deformed at conditions of 400-600°C and > 400 MPa (Raleigh and Paterson, 1965; Evans, 2004). Dehydration of serpentine, suggested by the formation of olivine from serpentine, was not observed in the thin-sections, indicating that temperatures did not reach levels higher than the stability of antigorite (greater than 400°C; O'Hanley, 1996).

Serpentine veins and faults record brittle deformation, which cut older serpentine textures. After the serpentinite was uplifted, it was exposed, weathered, and eroded. This is indicated by sedimentary units composed mostly of serpentinite that do not show deformation structures within the matrix, and by stratigraphic relationships with Late Cretaceous rocks. They probably represent underwater debris flows deposited on top of the massive and sheared serpentinite (Lockwood, 1971; Curet, 1981).

Olivine and pyroxene textures suggest a tectonic history in which the peridotite was initially affected by high temperature deformation flow in the mantle. The occurrence of spinel in the peridotite indicates that peridotite was formed at shallow depths within the mantle (e.g. Frost and McCammon, 2008). Coarse garnet peridotites, such as those found in Hispaniola and that form at ultra-high pressures (Abbot et al., 2001; Abbot et al., 2006), were not found in the ultramafic rocks of Puerto Rico. Serpentinization was such that, in places, the peridotite was completely serpentinized. Serpentinization widened fractures by the increase in volume of the rock (O'Hanley, 1992). Plastic deformation and the formation of mylonites might be caused by tectonic stress rather than diapirism at shallow depths. Continued stress and uplift distributed more brittle deformation throughout the serpentinite mass as expressed by faults that cut ductile structures.

2.7 CONCLUSIONS

The study of microstructures and textures in Monte del Estado and Río Guanajibo serpentinite bodies improve our understanding of its deformational processes. High temperature deformation in peridotite is suggested by granuloblastic olivine and foliation and lineation in porphyroclastic pyroxene. Replacement of serpentine textures and minerals is common throughout the serpentinite bodies. Serpentine mylonites are described for the first time in southwest Puerto Rico and indicate strong deformation at temperatures of 400-600°C and pressures greater than 400 MPa. Brittle deformation overprints ductilely deformed serpentinite.

Breccia composed of serpentinite was probably deposited as debris flows on top of the massive serpentinite (Curet, 1981). Deformation conditions may not be related to the proposed diapirism (Mattson, 1960; Schwartz, 1970; Jolly et al., 1998b). Instead the deformation might be caused in response to tectonic stresses at the Caribbean-North American plate boundary zone.

3.0 KINEMATIC ANALYSIS OF SERPENTINITE STRUCTURES AND THE MANIFESTATION OF TRANSPRESSION IN SOUTHWESTERN PUERTO RICO

3.1 INTRODUCTION

Exposures of serpentinite in the Greater Antilles at the Caribbean-North America plate boundary zone attest to the complex tectonic history of the region (Figure 3.1). In Cuba, most of the serpentinite occurs in the northern ultramafic belt, which is a serpentinite mélange that was thrust northward during multiple tectonic events beginning in the Early Cretaceous and ending in the Late Eocene (Draper and Barros, 1994; Cobiella-Reguera, 2005). Serpentinite in Hispaniola crops out in Duarte-Loma Caribe and North Coast belts and according to Bowin (1966), Nagle (1974), and Draper et al. (1996) was emplaced in the Aptian-early Albian and Paleocene, respectively. A small block of serpentinite is also exposed in the Blue Mountains of eastern Jamaica (Draper, 1979). In Puerto Rico, the serpentinite at least in Sierra Bermeja, has been classified as part of a serpentinite mélange where it contains pieces of Early Jurassic to Cretaceous chert, 120 My old amphibolite, metabasalt, schist, gneiss, and greenstone within the serpentinite (Mattson, 1960; Tobisch, 1968; Montgomery et al., 1994a; Schellekens, 1998).

The complex tectonic evolution of the Caribbean-North America plate boundary includes transpression, possible subduction polarity reversal, collisions, and changes of slip along fault zones (Glover, 1971; Erikson et al., 1990; Pindell, 1994; Draper et al., 1996). Although many

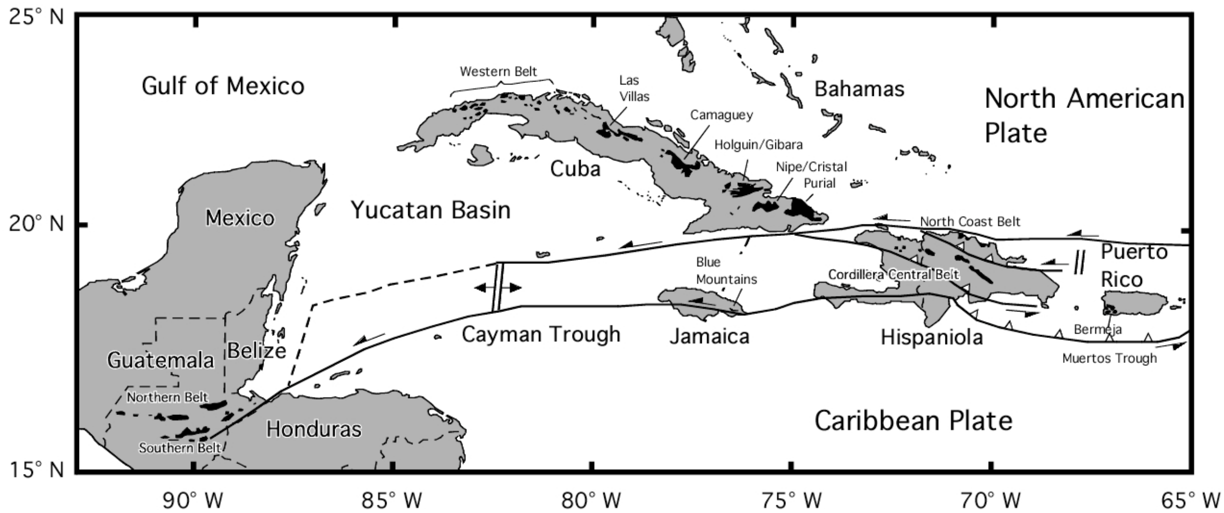


Figure 3.1: Tectonic setting of the current northern plate boundary between the Caribbean and North American plates showing the distribution of ultramafic rocks including serpentinite (modified from Wadge et al., 1984).

studies have described the spatial relationships, structural contacts, and stratigraphy of Caribbean serpentinite and related formations (Lewis et al., 2006a), studies of the internal structure of these rocks are limited. A better understanding of the internal strain and deformation of serpentinite is crucial to the understanding of the tectonic evolution of the Caribbean-North America plate boundary zone. Furthermore, constraining models of serpentinite deformation will help us to understand the role of serpentinite in a transpressive tectonic scenario. Transpression is the combination of contraction and strike-slip deformation in the lithosphere (Harland, 1971). It is common in collisional orogenic belts, oblique subduction margins, restraining bends, and in slate belts (Dewey et al., 1998). Masses of serpentinite, which contain metamorphic blocks, may occur within transpressive zones (e.g. Bailey et al., 2000; Harlow et al., 2004; Mori and Ogawa, 2005).

The objectives of this study are to further characterize the processes of deformation of serpentinite bodies in western Puerto Rico, to constrain the age of deformation, and to better understand the tectonic history of some of the oldest rocks in the northeastern Caribbean plate boundary zone. Shear zone and fault slip data within the serpentinite were measured, described, and analyzed with the goal of characterizing deformation of the ultramafic masses and identifying the tectonic context in which they evolved for this region.

3.2 REGIONAL SETTING

3.2.1 Puerto Rico

Puerto Rico currently lies within the plate boundary zone between the Caribbean and North American plates (Figure 3.1). The northern tectonic boundary of the island is characterized by highly oblique subduction as suggested by Global Positioning System studies (Jansma et al., 2000). The southern margin of Puerto Rico is delimited by the Muertos trough where underthrusting has been suggested to be currently occurring based on focal mechanisms of seismic events (Byrne et al., 1985). The island consists mainly of Cretaceous to Eocene volcanic and volcaniclastic rocks, limestone, and intrusive rocks (Figure 3.2). Early Jurassic to Late Cretaceous ultramafic rocks crop out in the southwest corner (Montgomery et al., 1994a), and gently dipping late Tertiary limestone strata crop out along the north and south coasts (Monroe,

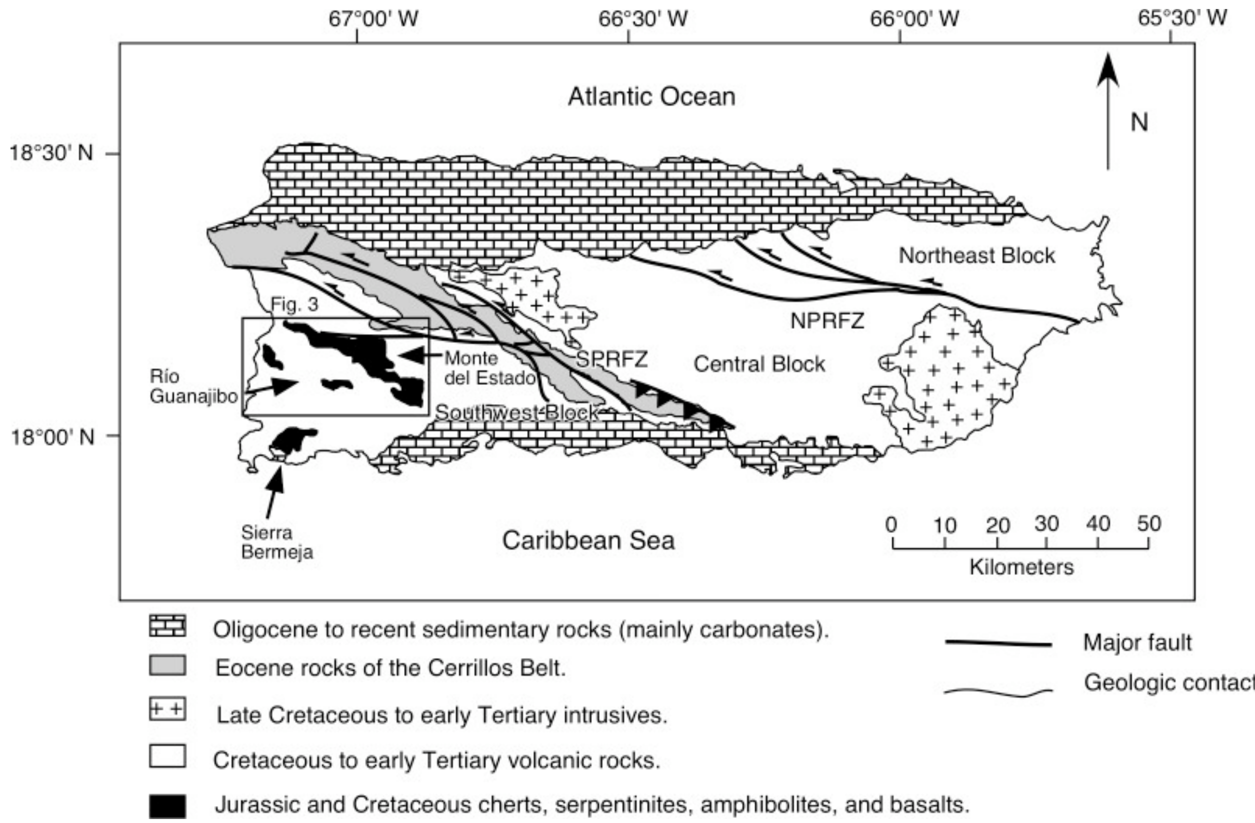


Figure 3.2: Generalized geologic map of Puerto Rico showing location of serpentinite bodies and major fault zones. The Southern Puerto Rico fault zone (SPRFZ) and the Northern Puerto Rico fault zone (NPRFZ) separate the island into three blocks (modified from Monroe, 1980).

1980). Two northwest-striking fault zones, the Northern Puerto Rico fault zone (NPRFZ) and the Southern Puerto Rico fault zone (SPRFZ); divide the island into three geologically disparate blocks: northeast, central, and southwest (Figure 3.2; Briggs and Akers, 1965; Glover, 1971).

The SPRFZ may have been active since the Early Cretaceous based on stratigraphic discrepancies of Cretaceous rocks across the fault zone (Glover, 1971). Subsequently, transpression has been suggested as the principal cause for deformation recorded in Eocene rocks of the Cerrillos belt (Dolan et al., 1991) that are deformed by thrust and left-lateral faulting. In the southern part of the fault zone, east of the town of Ponce, rocks of Eocene age are thrust over Cretaceous rocks towards the northeast in association with left-lateral faulting (Glover, 1971). Erikson et al. (1990) used paleostress studies of faults to suggest an asymmetric flower structure in the same region. Northwest, along the SPRFZ, paleostress analysis of contractional structures in the Eocene Río Culebrinas Formation at the northwestern limit of the fault zone also indicates transpression with the Cerro Goden fault accommodating most of the left-lateral movement (Laó-Dávila, 2002; Mann et al., 2005). Displacement along the SPRFZ is estimated to be approximately 22-50 km (Glover, 1971; Erikson et al., 1990).

Southwest Puerto Rico contains Jurassic to Early Cretaceous ultramafic rocks, Cretaceous volcanic and intrusive rocks, sedimentary rocks, and limestone, and Paleogene turbiditic sedimentary rocks and limestone (Figures 3.3 and 3.4). The structure of the region is generally characterized by southwest-verging folds with NW-trending fold axes, and steep faults with three different strike orientations: N45°E, N20°W, and E-W (Mattson, 1960).

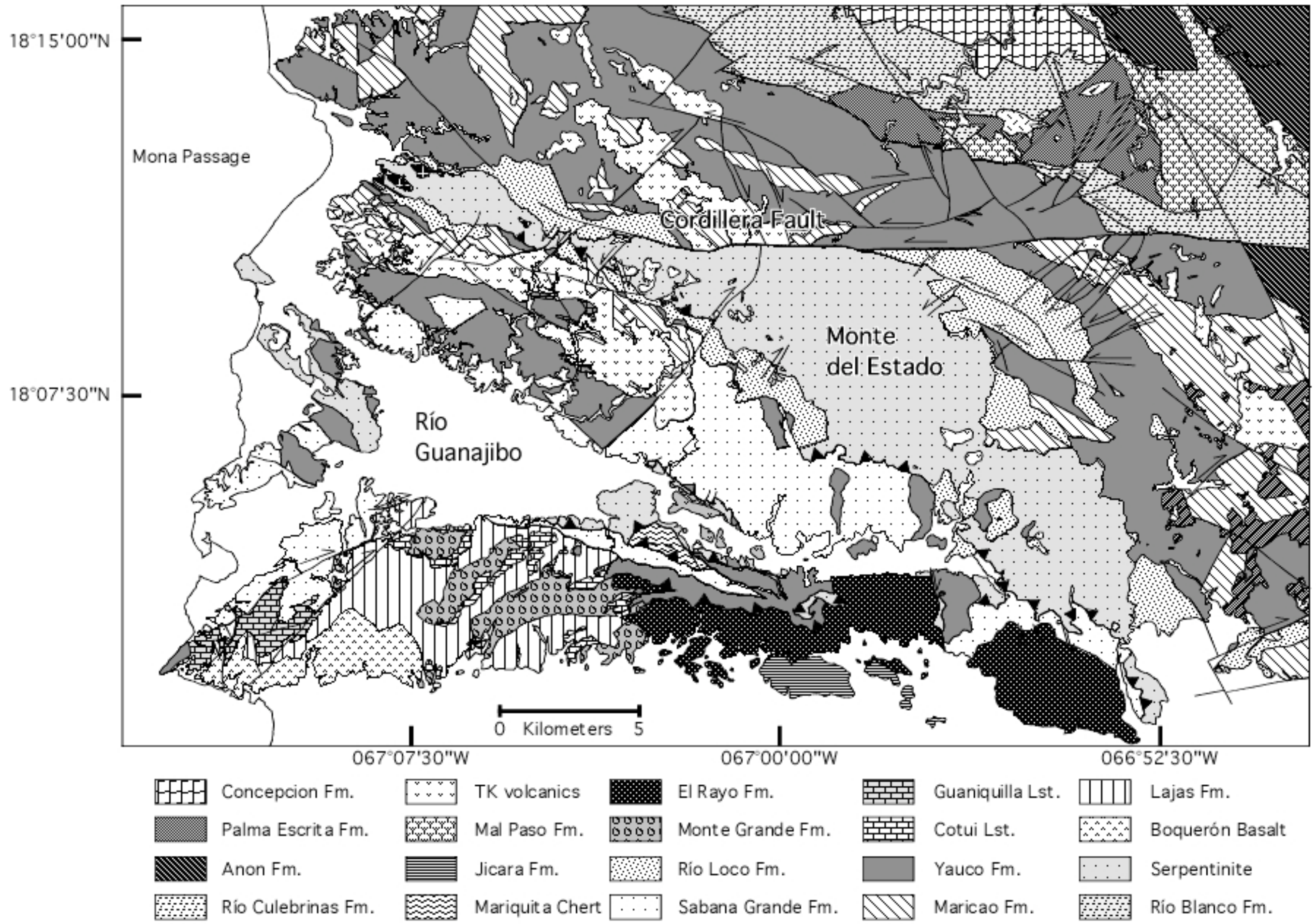


Figure 3.3: Geologic map of southwestern Puerto Rico (modified from McIntyre, 1975; Krushensky and Monroe, 1978; Volckmann, 1984a, 1984b, 1984c; Curet, 1986; Martínez-Colón, 2003; Llerandi-Román, 2004). Heavy lines are faults with dark triangles on hanging wall of thrust fault. Lighter lines are geological contacts.

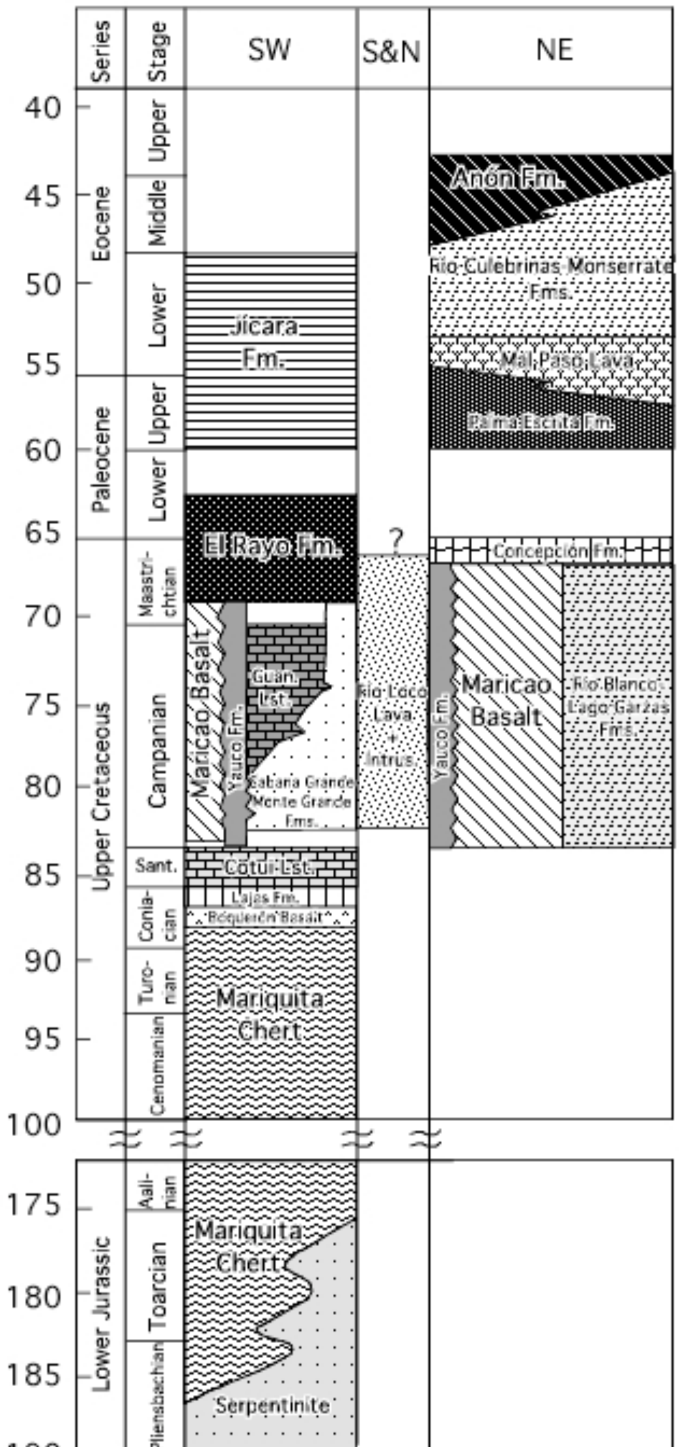


Figure 3.4: Stratigraphic column for southwestern Puerto Rico, southwest and northeast of Monte del Estado (modified from Jolly et al., 1998b; Santos, 1999; Santos, 2005). Guan. = Guaniquilla.

3.2.2 Serpentinite

In southwestern Puerto Rico, serpentinite underlies about 140 km^2 (Figure 3.2). Ultramafic rocks comprise three belts: 1) Monte del Estado serpentinite, 2) Río Guanajibo serpentinite, and 3) Sierra Bermeja (Mattson, 1960). The northwest-trending Monte del Estado mass is the largest and northernmost serpentinite body, extending from Mayagüez Bay to the southern part of the municipality of Yauco (Figure 3.3). The body is widest south of the town of Maricao where it is also topographically high, reaching 900 m above sea level. In contrast, the Río Guanajibo serpentinite is a smaller, low-lying, discontinuous, belt cropping out in the Guanajibo valley with a maximum elevation of about 165 m. The westernmost Río Guanajibo exposure is at Mayagüez bay from which it extends east and merges with the Monte del Estado belt near the town of Sabana Grande (Figure 3.3). The belt comprises isolated masses including Punta Guanajibo, San Germán, and smaller bodies to the east. Sierra Bermeja, which lies south of Lajas valley, is a ridge trending east-west. Serpentinite in the Sierra Bermeja is not conspicuous cropping out beneath more extensive chert. Amphibolite, metabasalt, and schist also occur within and around the serpentinite in this ridge.

The composition of the Río Guanajibo and Monte del Estado serpentinite is mostly chrysotile and lizardite (Hess and Otalora, 1964; Curet, 1981) that have formed from an ultramafic protolith composed of harzburgite, dunite, and lherzolite (Mattson, 1964; Schwartz, 1970; Curet, 1981). Fragments of amphibolite, schist, metabasalt, and chert are included within the serpentinite in the three belts (Schellekens, 1998) but are the most abundant rock types in the Sierra Bermeja body.

Mattson (1973) proposed that Sierra Bermeja, the southernmost belt, is a serpentinite mélange that was emplaced as a northward directed (present coordinates) thrust nappe in Early Cretaceous time. The obducted body may reflect a collision that occurred in response to a change in subduction polarity from northward- to southward-directed (present coordinates; Mattson, 1973). Subsequent uplift and erosion of the serpentinite was postulated based upon the presence of serpentinite clasts at the base of Yauco and Sabana Grande formations (Mattson, 1960; McIntyre, 1975; Curet, 1986; Martínez-Colón, 2003; Llerandi-Román, 2004). Sedimentary and volcanic rocks accumulated upon the serpentinite during the Late Cretaceous. Mattson (1960) also proposed that the serpentinite and the Late Cretaceous rocks were folded, with the serpentinite occupying the cores of anticlines during the Maastrichtian. Mattson and Schwartz (1971) suggested that diapirism continued to move the serpentinite upwards, in some places over the Late Cretaceous rocks.

Shear zones observed in serpentinite in southwestern Puerto Rico, which have diverse orientations, record heterogeneous strain indicative of the complex metamorphic and tectonic history of the serpentinite. Peridotite deformation is shown by pre-serpentinization structures. Serpentinization, which may have started during initial uplift of the peridotite close to the plate boundary, also creates structures within the rock. Early formed structural and textural features along which strain may be accommodated include: 1) pyroxene foliations and lineations formed before serpentinization, 2) variability in the serpentinization of the rock, 3) kernel joints or core-and-rim fractures formed by volume increase during serpentinization (Figure 3.5; O'Hanley, 1992), and recrystallization which can produce texture variability (O'Hanley, 1996). Tectonic stresses that were imposed upon this template composed of previously formed structures may re-activate existing structures or lead to formation of new shear zones.

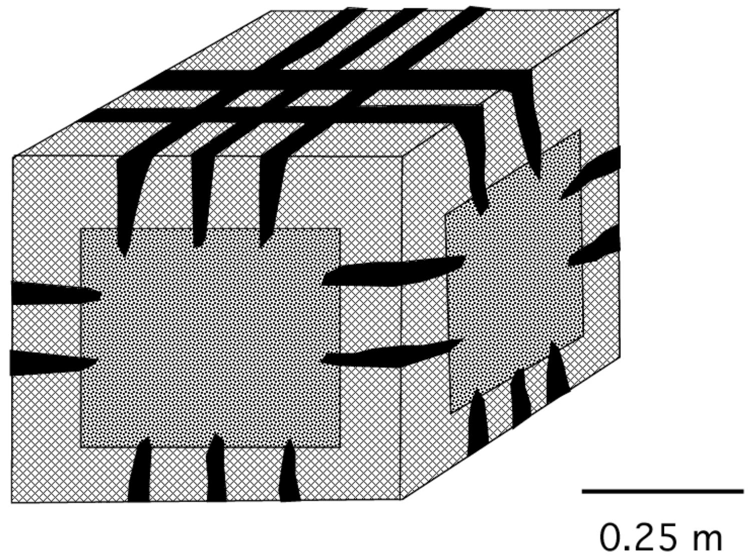


Figure 3.5: Kernel pattern in which the core is surrounded by a more serpentinized rim, veins, and fractures produced by differential serpentinization (modified from O'Hanley, 1992). Cross-hatched pattern represents serpentinized rim. Pattern with black squares represents unserpentinized core. Black bands represents fractures.

3.3 METHODS

Serpentinite bodies from the Monte del Estado and Río Guanajibo belts were chosen for this study because they are commonly well exposed and comprise large coherent masses. The orientations of planar and linear structures as well as sense of slip along faults and shear zones were measured from exposures along roads, rivers, quarries, cuts at construction sites, and from coastal exposures. Sense of slip in faults was determined by offset of rock layers, drag folds, and steps in slickensided surfaces. In ductile shear zones, sense of shear was determined from S-C fabrics and drag folds in the serpentine foliations. The slip direction in S-C fabrics is recorded on the C-plane and is perpendicular to the intersection of the S- and C-planes (Berthé et al., 1979; Stuart-Smith, 1990). Fault-slip and shear zone data are plotted on equal-area stereographic projections and their kinematics analyzed for strain characterization. Faults and ductile shear zones are analyzed together because both types of structures cut each other and they show similar strain characterization.

Shortening and extension (P and T) axes are calculated for geographic domains within the serpentinite using the method from Marrett and Allmendinger (1990). Each pair of axes lies in the movement plane that contains the slip vector (e.g. striation) and the normal vector (pole to fault), and makes angles of 45° with each of the vectors (Marrett and Allmendinger, 1990). The shortening and extension axes are directions converted from measurements in the shear plane and no interpretation is made in determining these directions (Marrett and Allmendinger, 1990). Shortening and extension axes were averaged separately and contoured using methods developed by Kamb (1959). The strain analysis method incorporates the following assumptions: 1) sampling is representative, 2) no post-faulting reorientation of the fault-slip directions, and 3) fault kinematics are scale-invariant (Marrett and Allmendinger, 1990).

3.4 RESULTS

3.4.1 Serpentinite Textures

Serpentinite is orange-green, dark green-grey, reddish, and blue-green, and it contains textures that may vary within a few meters in an outcrop. The texture of the serpentinite may be massive, brecciated, or schistose. Core-and-rim patterns (O'Hanley, 1996) are common in massive serpentinite (Figure 3.6a). Good examples of core-and-rim patterns are exposed at the coastal outcrops of the Río Guanajibo mass. Veins filled by oriented crystals of serpentine occur mostly within massive serpentinite. Some of the veins, up to 2 cm thick, are sheared and surround the serpentinized cores. Bastite crystals, up to 2 cm long, are conspicuous in massive serpentinite and commonly define foliation and lineation. Massive blocks of resistant core serpentinite with relict bastite crystals are commonly preserved within shear zones or schistose serpentinite. Joints are common, especially at the interface between the core-and-rim textures, where the oldest joints formed in response to volume increase during serpentinization (O'Hanley, 1996). Spaced joints can also form a tabular texture in massive serpentinite. Much of the massive serpentinite has polished slickensided surfaces indicating fault slip movement along fractures (Figure 3.6b). Curvilinear faults have developed commonly where slip is accommodated along connecting fractures. Overall, serpentinite is strongly deformed and contains shear zone orientations and types that are highly variable.

Figure 3.6: Serpentinite structures: a. Fractured massive serpentinite showing early deformation joints (18°09'55"N, 067°11'06"W), b. Slickensided steps on fault plane indicating direction of slip towards the left (18°08'14"N, 066°57'22"W), c. Shear zone showing S-C fabric and slip direction (18°11'30"N, 067°08'05"W), d. Serpentinite clast within shear zone (18°04'54"N, 067°04'17"W), e. Reverse fault (298°, 48° NE; 18°08'44"N, 066°57'07"W) showing common thrust fault orientation, f. Sub-vertical right lateral faults showing common right lateral orientation (336°, 81° NE; 18°09'52"N, 067°11'08"W), g. Low angle shear zone (300°, 27° SW with massive fractured serpentinite in the hanging wall (18°08'35"N, 066°57'30"W), h. Normal fault (213°, 65° SE) cutting thrust faults (293°, 41° NE; 18°05'56"N, 066°56'15"W).

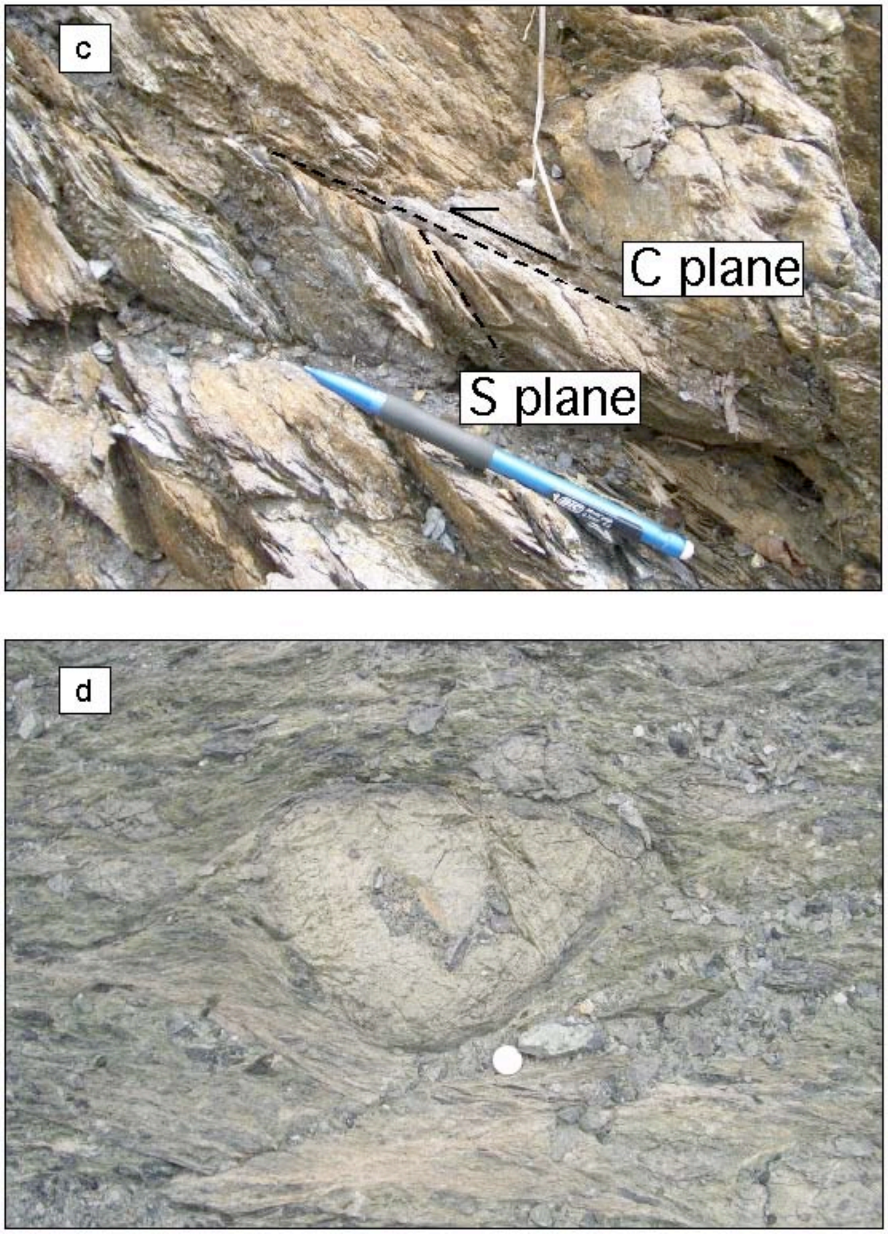
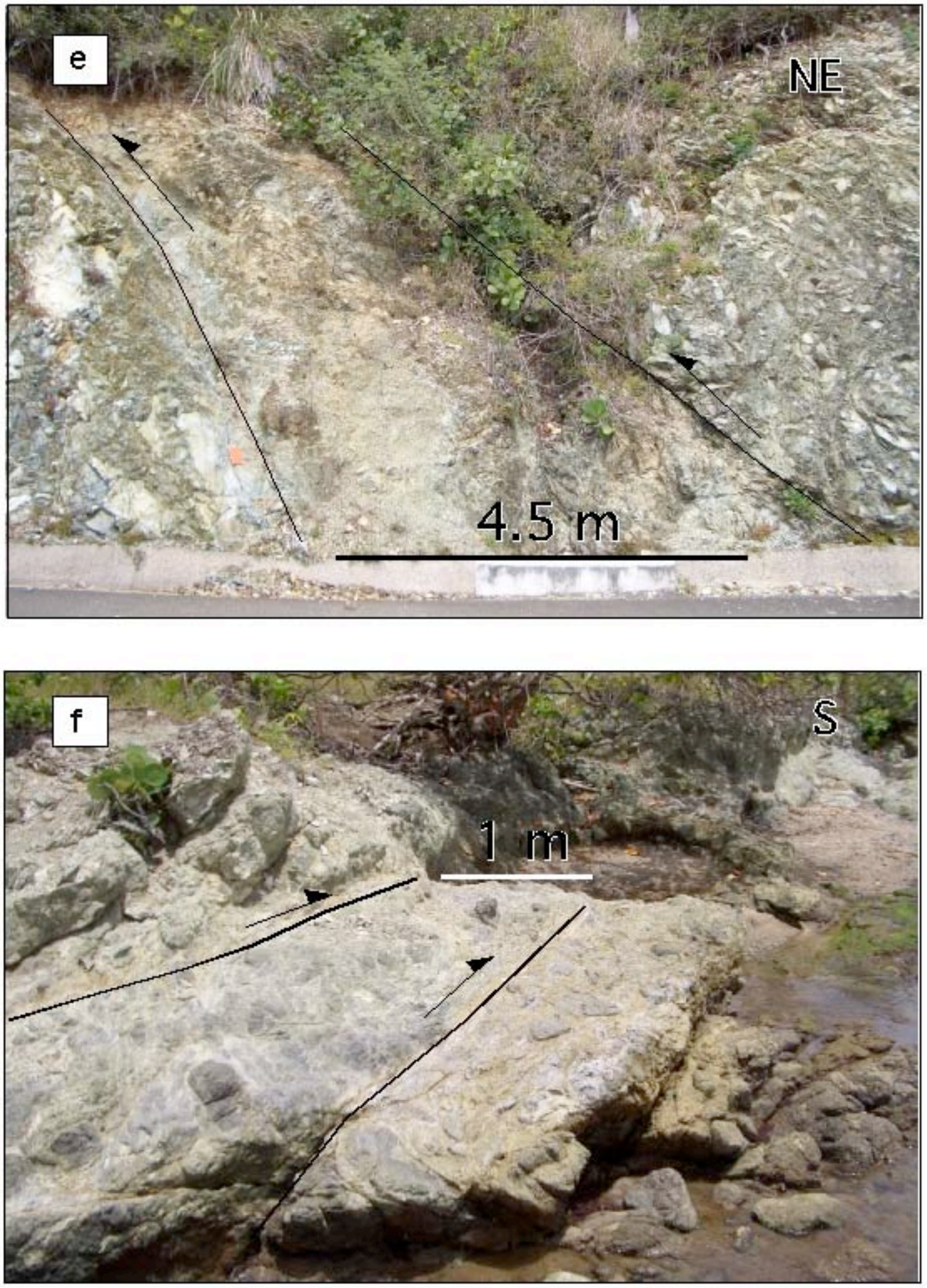


Figure 3.6 (continued)



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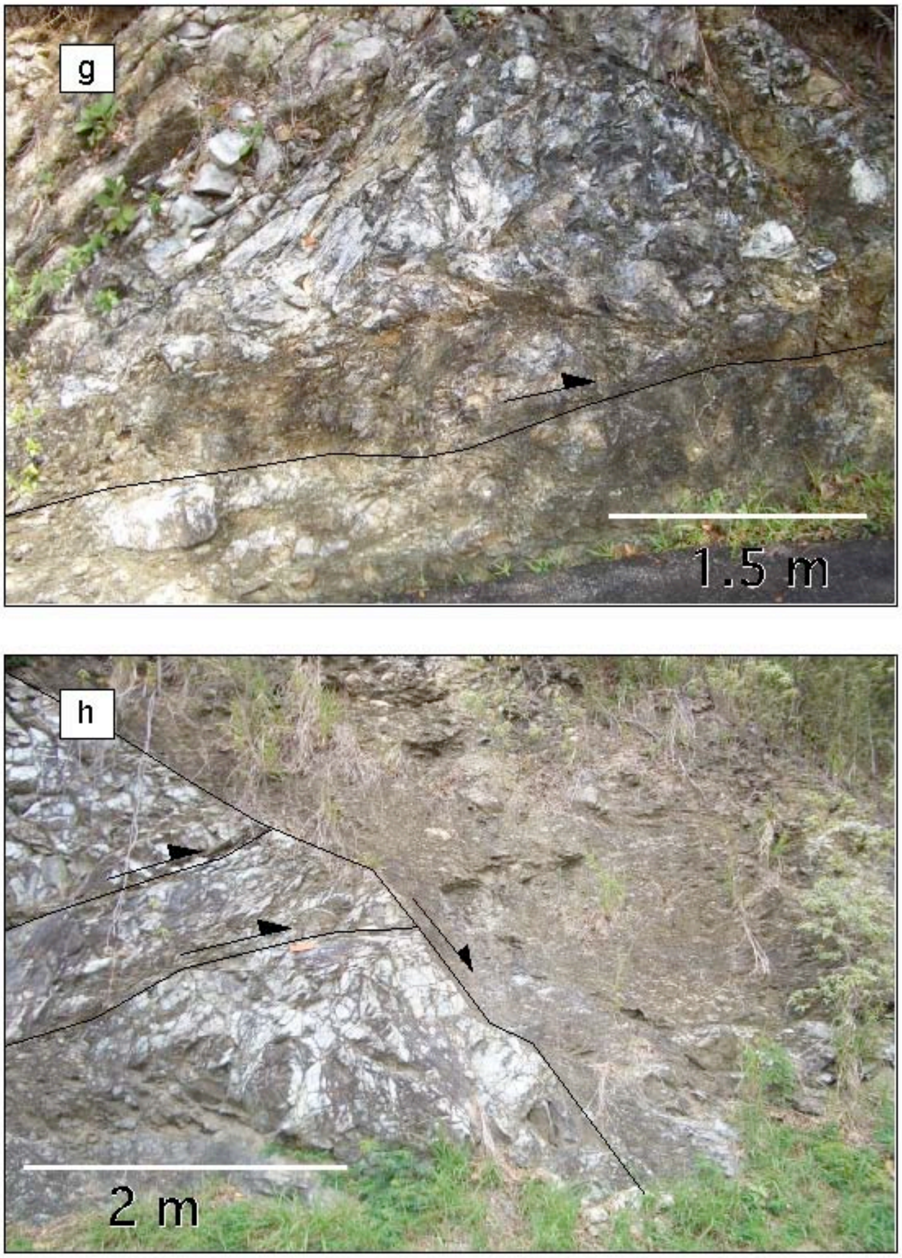


Figure 3.6 (continued)

3.4.2 Shear Zones

Conspicuous shear zones that commonly cut the serpentinite may be developed along faults or as part of zones of ductile deformation (Figure 3.6b-d). S-C structures within these shear zones are the most common ductile structures in the serpentinite (Figure 3.6c). A total of 1,422 of the 1,846 shear plane measurements had reliable sense of slip indicators and consequently were used in this study. Outcrops at more than 300 stations from which measurements were made are grouped into domains as shown in Figure 3.7. Domains were chosen based on spatial relationships such as: 1) isolated bodies (e.g. Cerro Las Mesas domain), 2) proximity to major structures or contacts (e.g. Cordillera Fault and Rosario domains), and 3) data collected along a road (e.g. Santana domain). Strain results are presented for every domain as opposed to every station because of the difficulty of displaying the data for more than 300 stations. Moreover, presentation of data as shear plane type (thrust, strike-slip, and oblique) yields a more robust strain characterization for the study area. Results are shown in Figures 3.8-3.10 and in Table 1.

3.4.3 Thrust Faulting

The most common structures are shear zones with thrust or reverse sense of movement. Most thrust faults strike NW-SE, have a low dip angle (<30°), and show top towards S or SW (Figure 3.6e, g, and h). Slip indicators plunge towards the NE or N (Figure 3.8a). Thrust faults strike ESE in the Rosario and Sabana Alta domains (Figure 3.10). At Cerro Las Mesas, Cordillera Fault, Maricao Afuera, and Susúa thrusts mostly strike E-W. All domains have slip directions

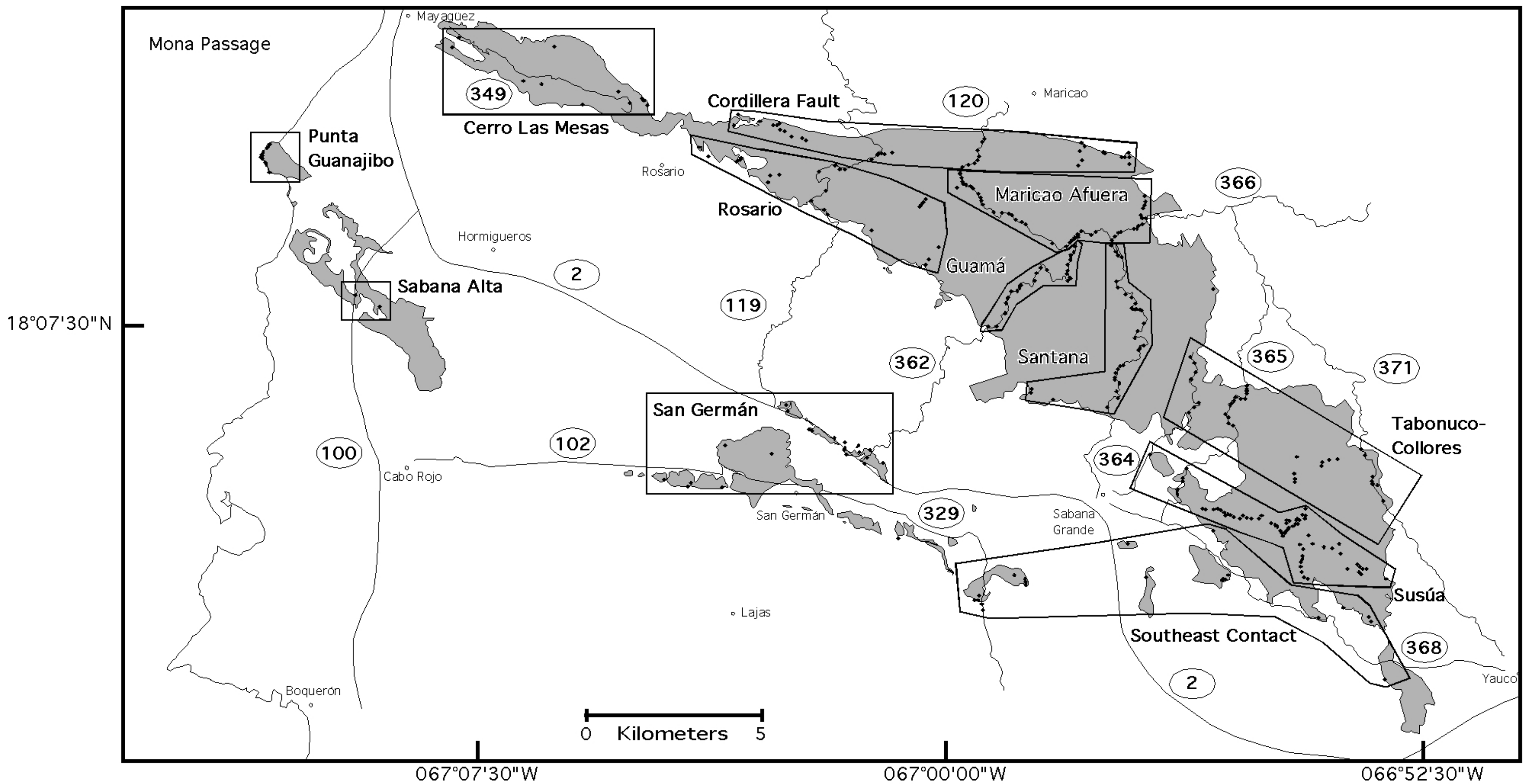


Figure 3.7: Map showing domains, and data collection sites in the Monte del Estado and Río Guanajibo serpentinite. Boxes indicate area encompassed by each domain and data sites within it. Numbers inside ovals indicate road numbers. Map of serpentinite is adapted from Curet (1986), Volckmann (1984b; 1984c), McIntyre (1975), Martínez-Colón (2003), and Llerandi Román (2004).

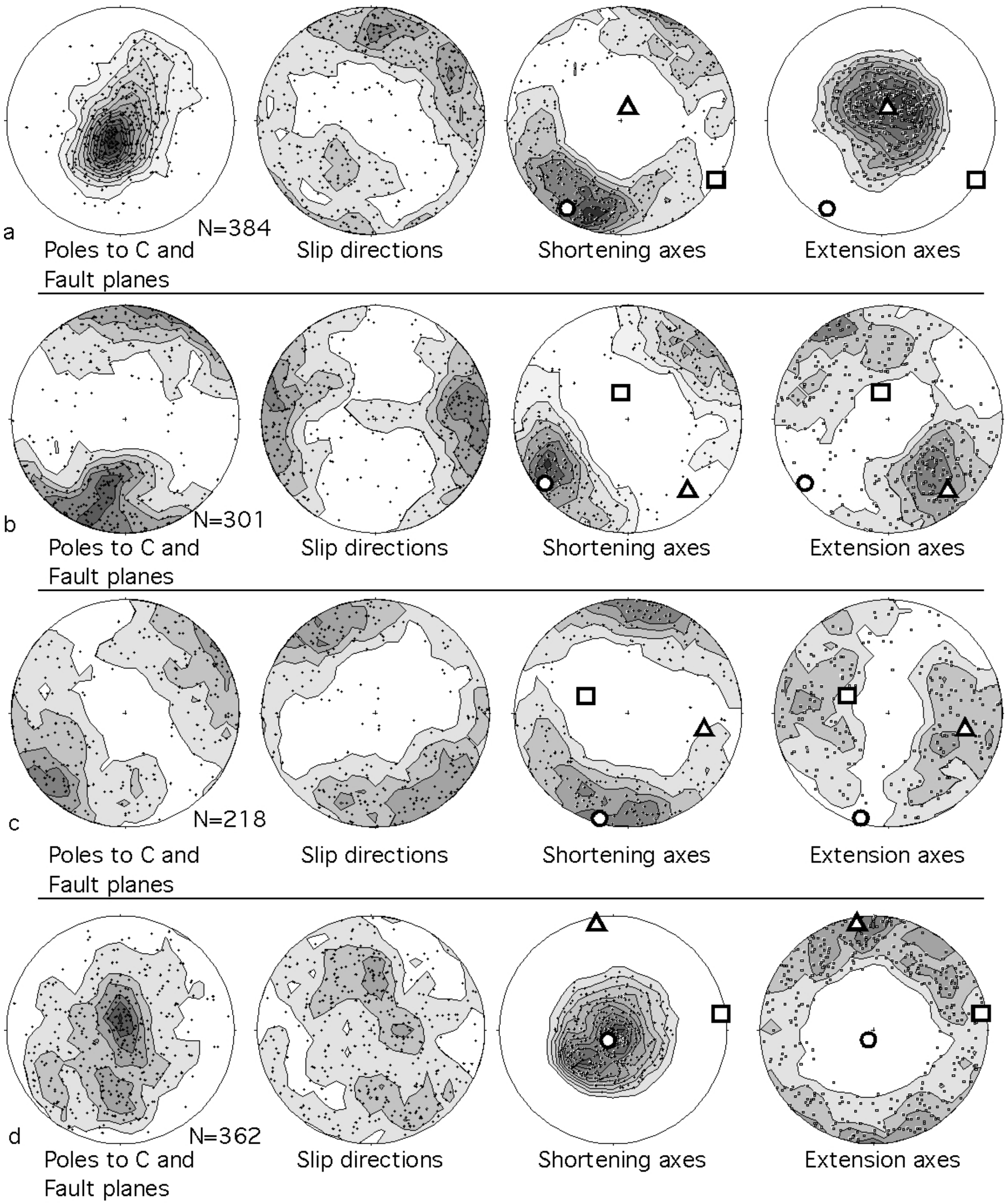


Figure 3.8: Shear zone data for Monte del Estado serpentinite grouped by type. a. Thrust faults, b. Left-lateral faults, c. Right-lateral faults, d. Normal faults, Circle = maximum strain direction, square = intermediate strain direction, triangle = minimum strain direction. Kamb contours are used to display data. Contour interval = 2.0 sigma.

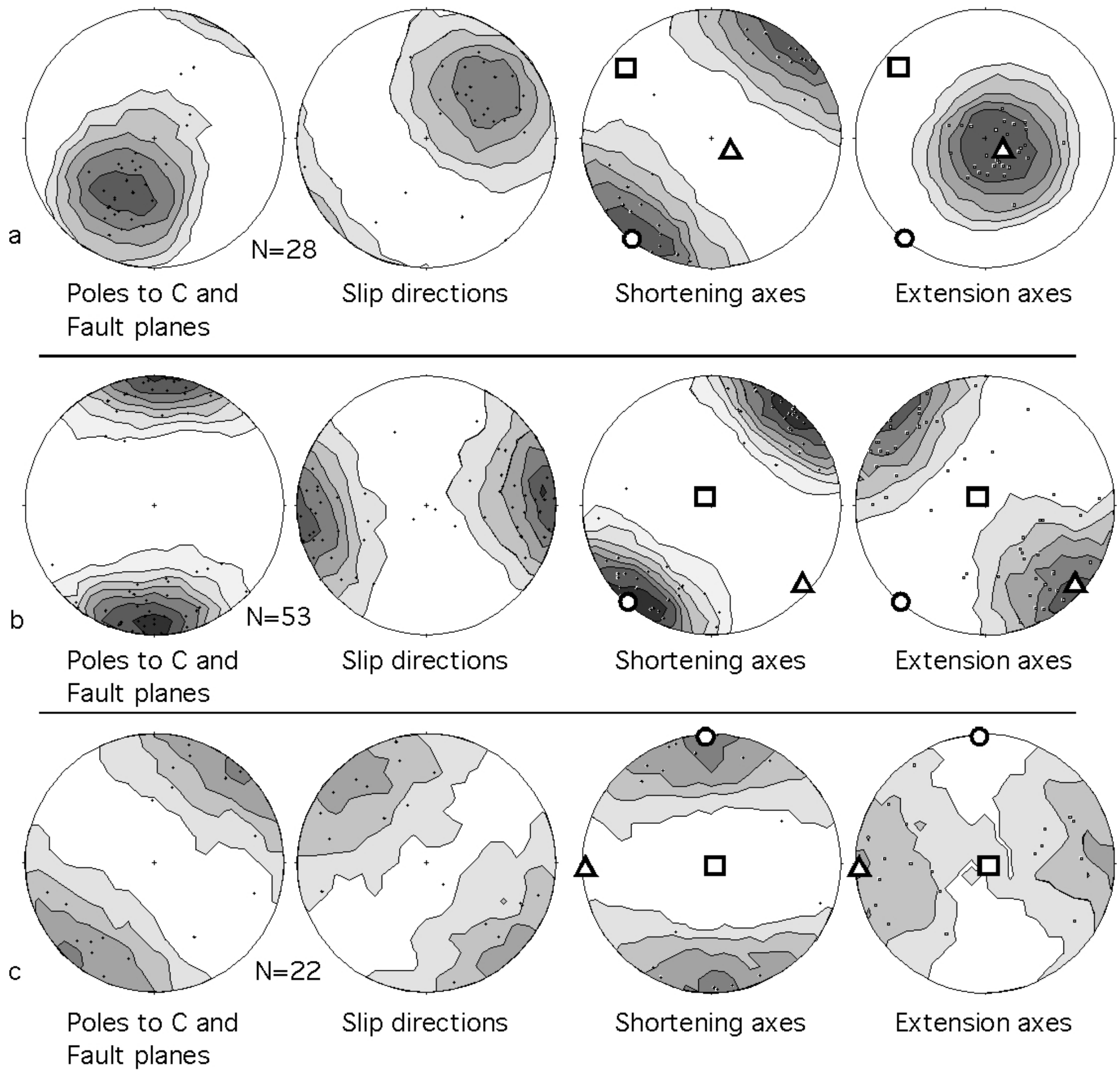


Figure 3.9: Shear zone data for Río Guanajibo serpentinite grouped by type. a. Thrust faults, b. Left-lateral faults, c. Right-lateral faults, d. Normal faults. Circle = maximum strain direction, square = intermediate strain direction, triangle = minimum strain direction. Kamb contours are used to display data. Contour interval = 2.0 sigma.

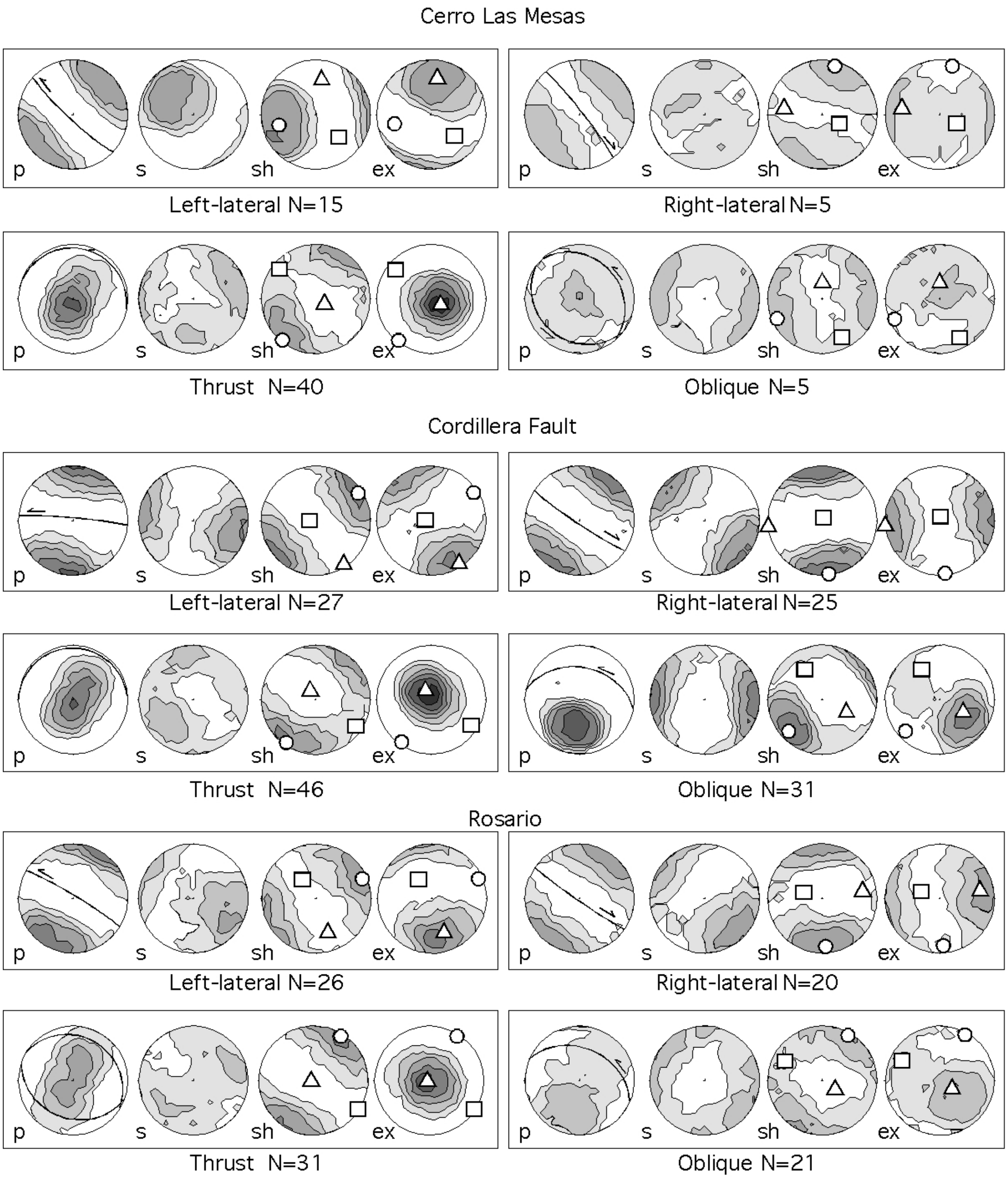
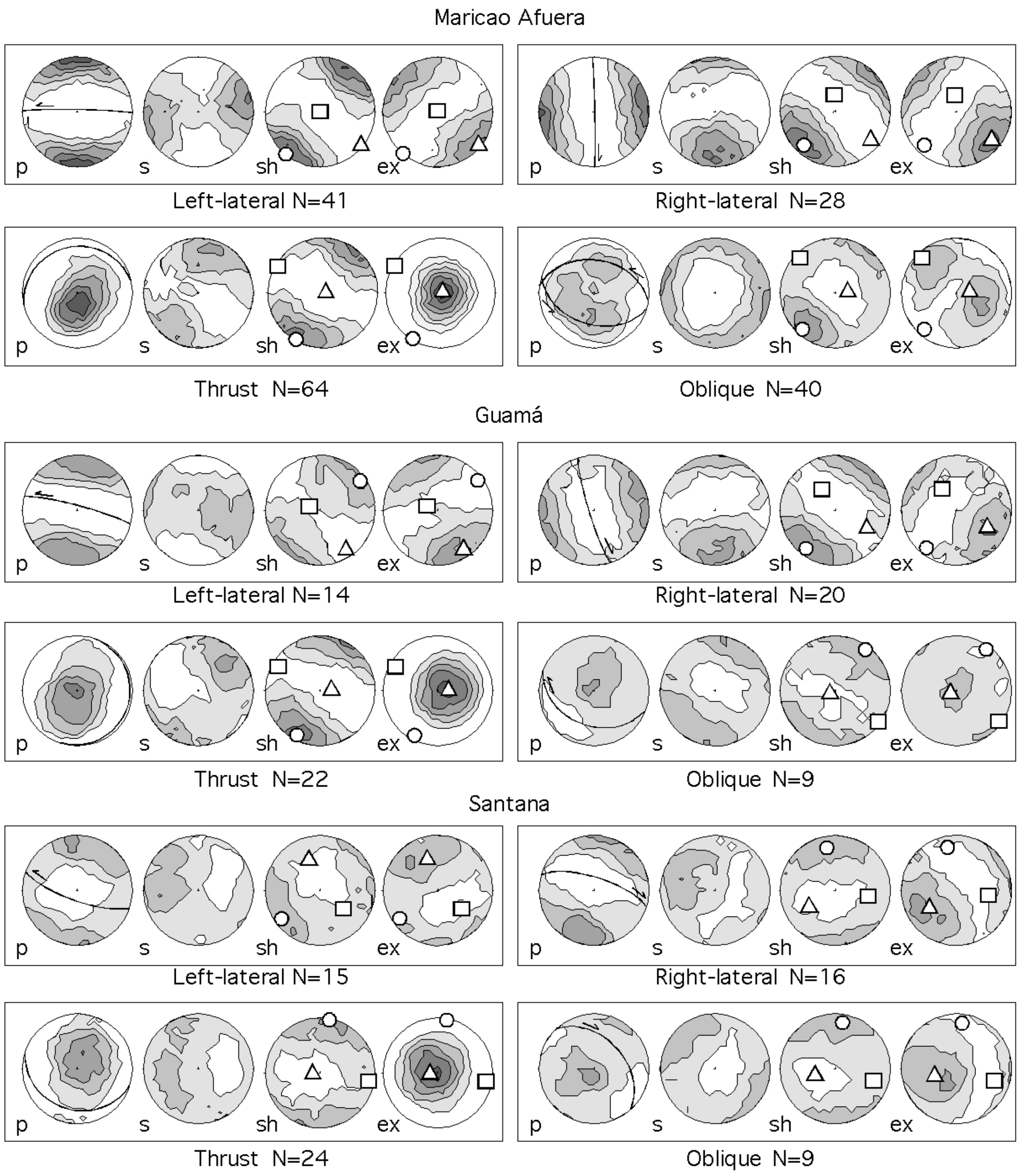


Figure 3.10: Equal-area stereographic projections of structural data in the serpentinite for each domain (see Figure 3.7). p = poles to C- and fault planes, s = slip directions, sh = shortening axes, ex = extension axes, Circle = maximum strain direction, square = intermediate strain direction, triangle = minimum strain direction. Contours show line concentrations. Contour interval = 2.0 sigma.



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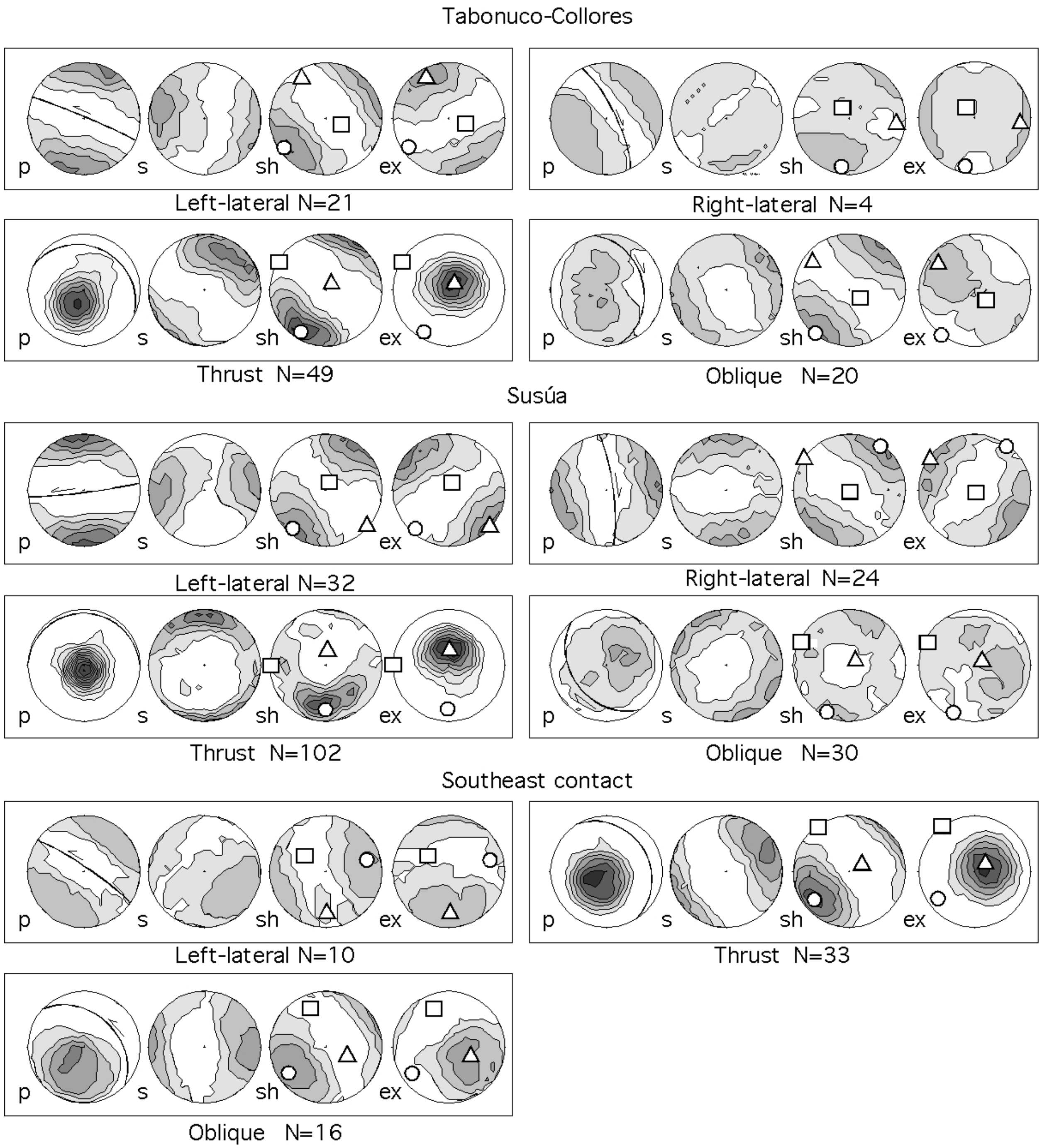

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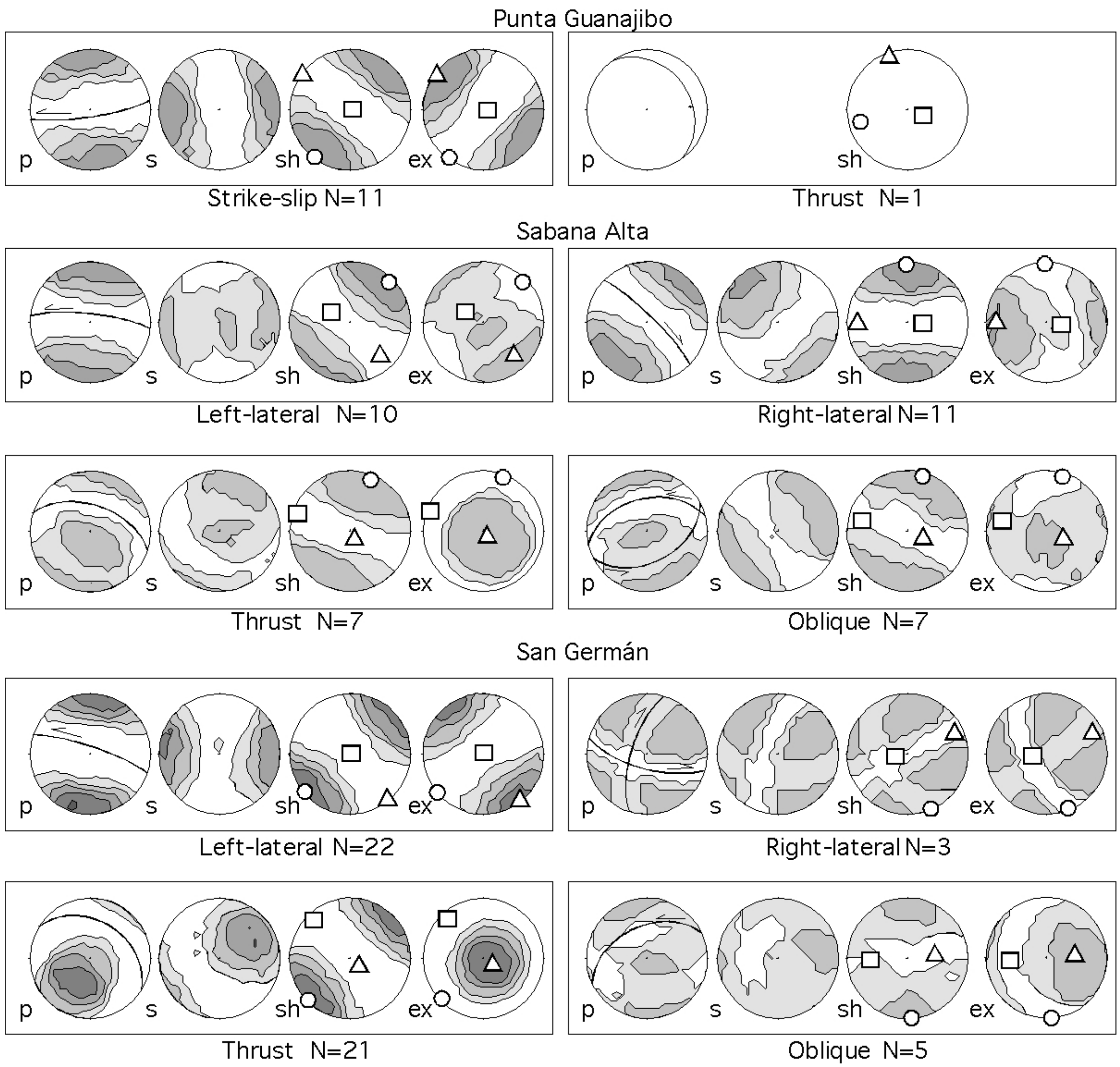


Figure 3.10 (continued)

Table 1: Strain axes for geographic domains throughout the serpentinite. LL = left-lateral; RL = right-lateral; O = oblique; T = thrust. Axes orientations presented as azimuth/plunge.

Domain	Type	Axis 1 (shortening)	Axis 2 (intermediate)	Axis 3 (extension)	N
Cerro Las Mesas	LL	256/32	133/41	033/10	15
	RL	014/008	117/59	280/30	5
	O	246/11	152/22	001/65	5
	T	219/04	310/16	116/74	40
Cordillera Fault	LL	056/06	278/82	147/06	27
	RL	173/04	021/86	263/02	25
	O	227/16	329/37	118/48	31
	T	215/06	123/12	330/77	46
Rosario	LL	067/009	324/55	162/34	26
	RL	176/13	291/60	80/26	20
	O	029/04	297/25	126/65	21
	T	033/03	123/01	234/87	31
Maricao Afuera	LL	219/02	347/87	129/03	41
	RL	223/17	353/64	127/19	28
	O	223/13	316/12	087/72	40
	T	212/03	302/02	065/86	54
Guamá	LL	053/09	293/73	146/14	14
	RL	218/14	327/54	119/33	20
	O	036/07	126/04	243/82	9
	T	208/10	300/14	084/72	22
Santana	LL	234/16	129/43	339/43	15
	RL	349/22	098/39	237/43	16
	O	009/16	107/27	252/58	9
	T	010/01	100/09	272/81	24
Tabonuco-Collores	LL	236/13	112/68	330/18	21
	RL	190/14	325/71	097/13	4
	O	217/00	127/70	308/20	20
	T	211/12	302/03	045/77	49
Susúa	LL	221/12	029/78	131/03	32
	RL	035/001	140/87	305/03	24
	O	205/09	296/06	061/79	30
	T	181/22	271/01	004/68	102
Southeast contact	LL	074/24	309/53	177/27	10
	O	236/22	338/28	113/54	16
	T	234/21	325/05	067/68	33
Punta Guanajibo	SS	217/04	084/85	307/04	13
Sabana Alta	LL	044/06	303/62	138/27	10
	RL	359/03	096/70	268/20	11
	O	016/05	284/24	117/65	7
	T	021/06	291/08	148/80	7
San Germán	LL	230/03	020/87	140/01	22
	RL	158/03	258/74	067/15	3
	O	176/01	266/39	085/51	5
	T	226/04	317/14	121/75	21

that trend NE (Figure 3.10). Data from Cerro Las Mesas, Cordillera Fault, Maricao Afuera, Guamá, Santana, and Susúa domains also show additional slip directions trending N and S.

3.4.4 Left-Lateral Faults

Left-lateral shear zones are the most abundant strike-slip shear zones in the study area (Figures 3.8b and 3.9b). Most of these structures strike WNW-ESE and have dips greater than 60°. Oblique shear zones that strike E-W and dip 30°-60° to the N or S are also common; most strike E-W. Northwest-southeast striking left-lateral shear zones characterize the structure of Cerro Las Mesas, Rosario, and Southeast contact domains (Figure 3.10). Most left-lateral shear zones strike E-W at the Punta Guanajibo, San Germán, Maricao Afuera, and Susúa domains. Whereas most slip lines trend E and W, variations in trend exist among domains. Slip lines in Cerro Las Mesas, Rosario, and Santana domains trend NW and SE. In Maricao Afuera and Guamá they trend E and W. However, they trend ESE and WNW in the Cordillera Fault domain, and WSW and ENE in the Susúa domain.

3.4.5 Right-lateral faults

Most right-lateral faults are steep and strike NW-SE (Figures 3.6f, 3.8c, and 3.9c). Oblique right-lateral faults also strike NW-SE. Some of these orientations may be similar to orientations of the left-lateral shear zones. However, right-lateral shear zones at Maricao Afuera strike N-S, within the Punta Guanajibo, Guamá, Tabonuco-Collores, and Susúa domains strike NNW-SSE, and at San Germán domain strike E-W (Figure 3.10). Most slip indicators trend SE, SSW, and NW.

Slip directions trend N and S in the Maricao Afuera, Guamá, Tabonuco-Collores, Susúa, and Punta Guanajibo domains.

3.4.6 Normal Faults

Shear zones with normal sense movement are conspicuous and occur in all domains (Figure 3.6h). Most have shallow dips and strike E-W. A set has slip lineations that trend NNW and SSE and a smaller group of shear zones shows easterly slip direction (Figure 3.8d). Normal shear zones are grouped and discussed together because they cut thrust and strike-slip faults and therefore are believed to be younger than the shortening structures.

3.4.7 Kinematic Significance of Shear Zones

Kinematic axes for shear zones grouped by sense of displacement are shown in Figure 3.8. Overall shortening directions determined from thrust and strike-slip shear zones cutting the serpentinite in Monte del Estado vary from SSW to WSW. Conjugate and strain compatible structures can be divided into three main groups based on shortening directions (Figure 3.11). A N-S shortening group consists of NW-SE striking right-lateral faults, fewer NE-SW striking left-lateral faults, and an E-W striking thrust shear zones. The largest group displays NE-SW shortening and consists of E-W mostly oblique left-lateral faults, N-S right-lateral shear zones, and NW-SE striking thrust shear zones. A third set dominated by NW-SE striking left-lateral shear zones can also be grouped from an E-W shortening direction. Fewer shear zones constitute a group formed by NW-SE shortening. Slickenlines that occur on C-planes may have the same kinematic direction as shown by the S-C planes. In addition, many faults have different sets with

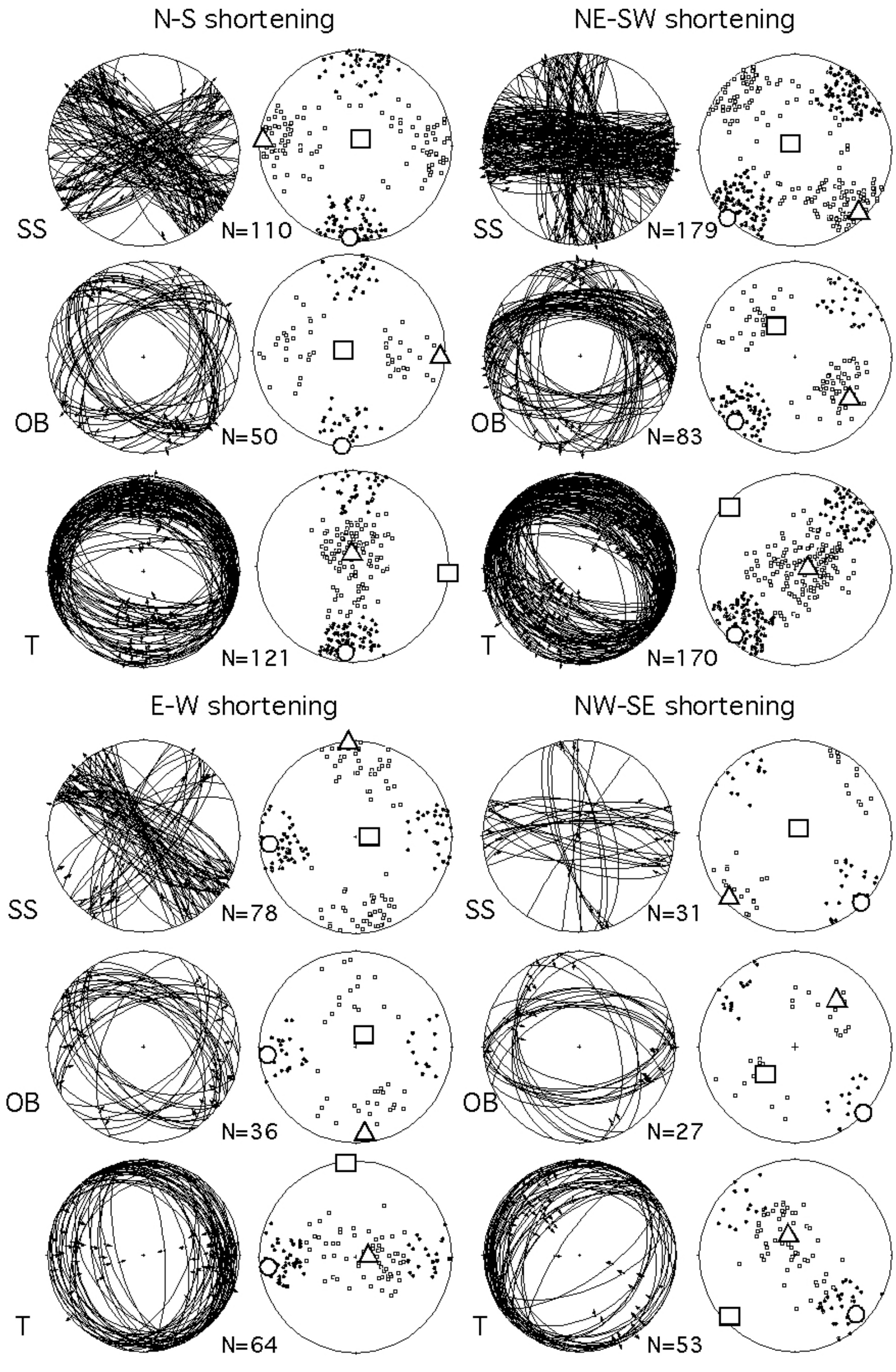


Figure 3.11: Shear zone slip data for Monte del Estado and Río Guanajibo areas grouped by shortening direction. ss = strike-slip, ob = oblique, t = thrust fault, closed circles = shortening axes, open squares = extension axes, Circle = maximum strain direction, square = intermediate strain direction, triangle = minimum strain direction.

different orientations of slickenside striations indicating multiple fault movements. A summary of maximum horizontal shortening direction by domain that incorporates the strain compatibility of structures is presented in Figure 3.12.

Conspicuous southwesterly directed shortening is recorded by some structures in all domains although variability in the shortening directions is shown locally. Thrust and right-lateral shear zones show the most variability in shortening direction, whereas left-lateral strike-slip faults define tighter clusters of shortening axes. Extension axes derived from analysis of strike-slip shear zones show intermediate strain axes that plunge ~45° indicating the presence of oblique shear zones. Extension axes from the normal shear zones of the Monte del Estado distinguish two groups with NE-SW and NNW-SSE extension directions (Figure 3.8d).

In the Cerro Las Mesas domain, the general shortening direction of left-lateral and thrust shear zones is WSW (Figure 3.10). Most thrusts, however, show SW-directed shortening. Near the Cordillera fault (Cordillera Fault and Rosario domains) strike-slip faults show two maxima indicating southward- as well as southwestward-directed shortening. Thrusts in the Cordillera Fault domain also show two maxima. The Santana domain shows broader and less coherent maxima compatible with SE-SW and NE-NW shortening. Thrusts within the Susúa domain show maxima trending S and SE.

Strain axes in the Río Guanajibo body are similar to the strain axes in Monte del Estado; however, their directions vary less than the larger body (Figure 3.9). SW-directed shortening is common throughout the mass. Strike-slip structures dominate in the coastal area at Punta Guanajibo and locally along the southern margin of the mass. Thrust shear zones dominate in the other areas (Figure 3.10). A south-southwesterly average shortening direction is preserved near the Sabana Alta area.

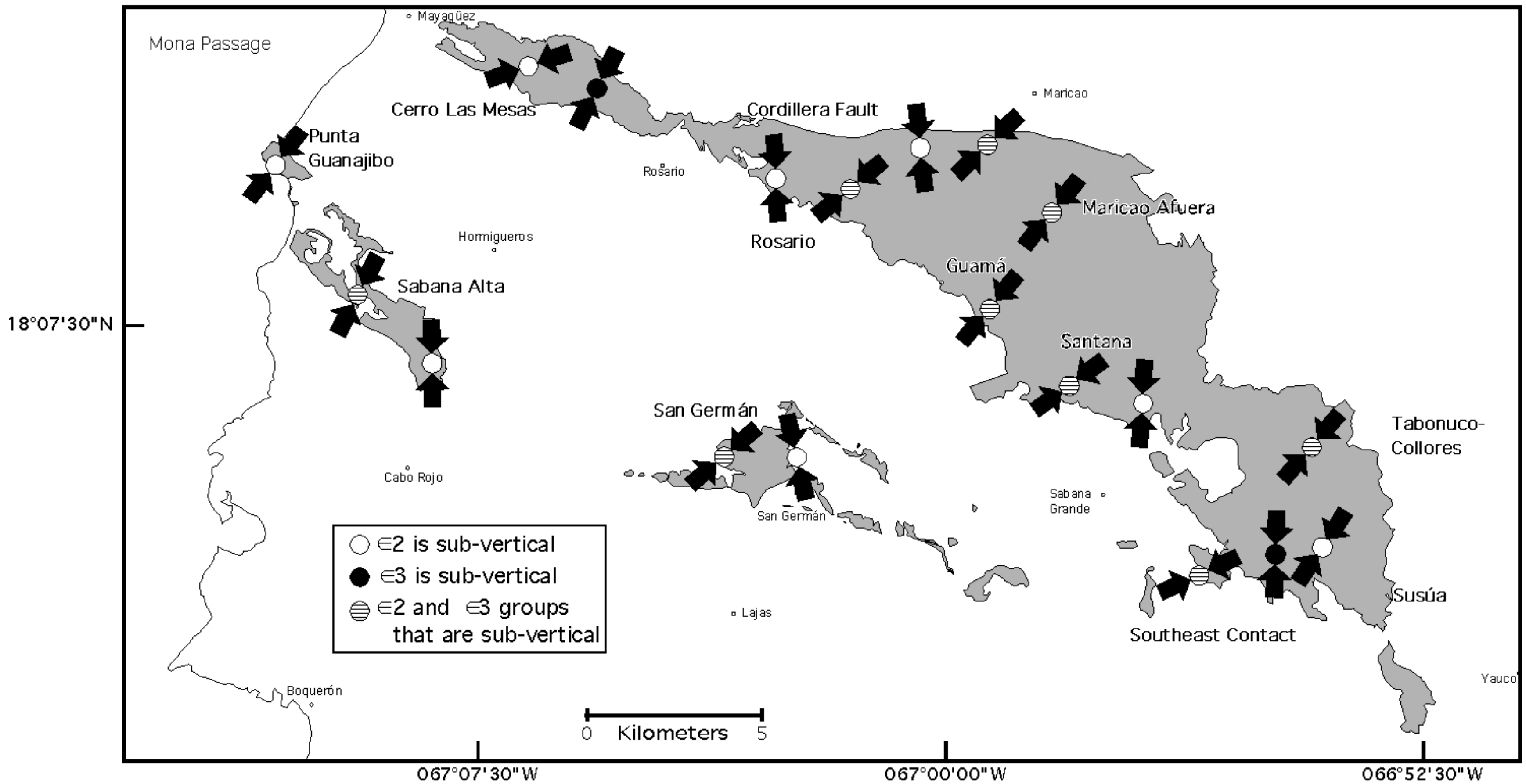


Figure 3.12: Map showing strain pattern in the Monte del Estado and Río Guanajibo serpentinite. Arrows indicate maximum horizontal shortening direction. Open circles where intermediate strain axes are sub-vertical, closed circles where minimum strain axes are sub-vertical, and circles with horizontal line pattern where maximum shortening strain axes of strike-slip and thrust faults are compatible. Map of serpentinite is adapted from Curet (1986), Volckmann (1984b; 1984c), McIntyre (1975), Martínez-Colón (2003), and Llerandi Román (2004).

3.4.8 Age of structures

Relative timing of structures within the serpentinite is difficult to establish because structures with different orientations are common and because many faults have been re-activated. In general left-lateral shear zones cut right-lateral and thrust shear zones. Thrust and right-lateral shear zones cut each other, and right-lateral shear zones cut left-lateral shear zones. These relationships suggest that many strike-slip faults and thrusts are coeval.

However, grouping compatible shear zones by shortening orientation (N-S, NE-SW, E-W, NW-SE) yields additional information on cross-cutting relationships (Figure 3.11). Structures were grouped based on the orientation of the strain axes and dip of shear planes. For a N-S shortening direction, maximum strain axes with azimuths of 45° or less from the N and S directions were grouped. Structures were then separated into strike-slip, oblique and thrust based on the orientation of the minimum strain axes and fault dips. Minimum strain axes with plunges greater than 60° were grouped in the thrust group. Structures with dips ranging from 30° to 60° and minimum strain axes plunging less than 60° were grouped in the oblique group. Structures with both minimum and maximum strain axes plunging less than 60° and dips greater than 60° were grouped in the strike-slip group. A similar separation of data was done for groups with shortening directions of the NE-SW, E-W, and NW-SE. Shear zones compatible with a N-S and NE-SW shortening directions cut each other. Shear zones compatible with an E-W shortening directions cut shear zones compatible with a NE-SW shortening direction the most, and also to a lesser extent cut shear zones compatible with a N-S shortening direction. Shear zones compatible with an E-W shortening direction are cut the least by other shear zones. Shear zones compatible with a NW-SE shortening direction cut all other shear zones the least perhaps due to the fewer measurements compatible with this shortening direction. Contractional structures that are compatible with a NE-SW and N-S shortening directions are cut the most by other structures. These cross-cutting relationships suggest that shear zones compatible to shortening directions of N-S and NE-SW are older and E-W shortening directions are younger. Moreover, some NW-SE striking left-lateral shear zones seem to cut along preexisting NW-SE striking right-lateral shear zones as indicated by reactivated shear planes.

Absolute ages of deformations are difficult to establish because of the lack of isotopic ages. However, at the southern contact of Monte del Estado, serpentinite is thrust over late Maastrichtian-Paleocene steeply dipping limestone and volcanic rocks of El Rayo Formation (Slodowski, 1956; Llerandi Román, 2004). This indicates that contractional deformation of the serpentinite occurred during or after late Maastrichtian-Paleocene. Furthermore, the Paleocene-Eocene Jicara Formation may be involved in the deformation.

Most normal shear zones cut strike-slip and thrust shear zones, and based on this relationship normal shear zones are believed to be young. However, normal shear zones that are compatible with the strain regime for the contractional structures (i.e. perpendicular to thrust shear zones) may have formed at the same time as the shortening structures. Brittle faults and ductile shear zones within the serpentinite cut each other, indicating a similar age and conditions at the brittle-ductile transition for their development.

3.5 DISCUSSION

Kinematic analysis of contractional structures in serpentinite shows that the oldest deformations are related to N and NE directed maximum strain, and the younger deformation is related to an E directed maximum strain. Shear planes compatible to a NW-SE direction are few compared to other groups and their cross-cutting relationships are not clear. Shear planes from this group may have been rotated from shear planes originally compatible with the N and E shortening directions. Alternatively, they could represent an older deformation during which thrust faults dominate (Early Cretaceous obduction?; Mattson, 1973). However, this group does not constitute a dominant set of faults in any of the geographic domains (Figure 3.10), it contains the fewest shear planes, and their cross-cutting relationships are uncertain. Thus, they will be treated as rotated from other groups and will not be discussed any further. Shear planes attributed to the Early Cretaceous obduction described by Mattson and Pessagno (1979) are not recognized.

A working hypothesis is that early contraction began with N-S shortening, followed by initiation of NE-SW shortening, and finally the shortening direction changed to an E-W direction (Figure 3.13). Anticlockwise vertical axis rotation of southwest Puerto Rico (van Fossen et al., 1989) may have rotated older structures more than younger ones and account for some of the variability in shear zone orientation. Also, there may have been rotation of faulted blocks within the serpentinite that may be responsible for the orientation variation. The structures associated to N- and NE-directed maximum strains have about an equal amount of thrust and strike-slip faults. The group of shear planes of the youngest E-directed contractional deformation has about the same amount of thrust and strike-slip faults, however strike-slip faults dominate and especially those with left-lateral sense. Thus, there is change from older slight thrust fault dominance (N, NE directed strain) to younger slight left-lateral fault dominance (E directed strain). A change in the orientation of stresses may be the cause for the orientation of these younger structures.

Late Eocene-Early Oligocene contractional structures in Eocene rocks of the Cerrillos belt are similar in orientation to structures recorded in the serpentinite. In the northern Cerrillos

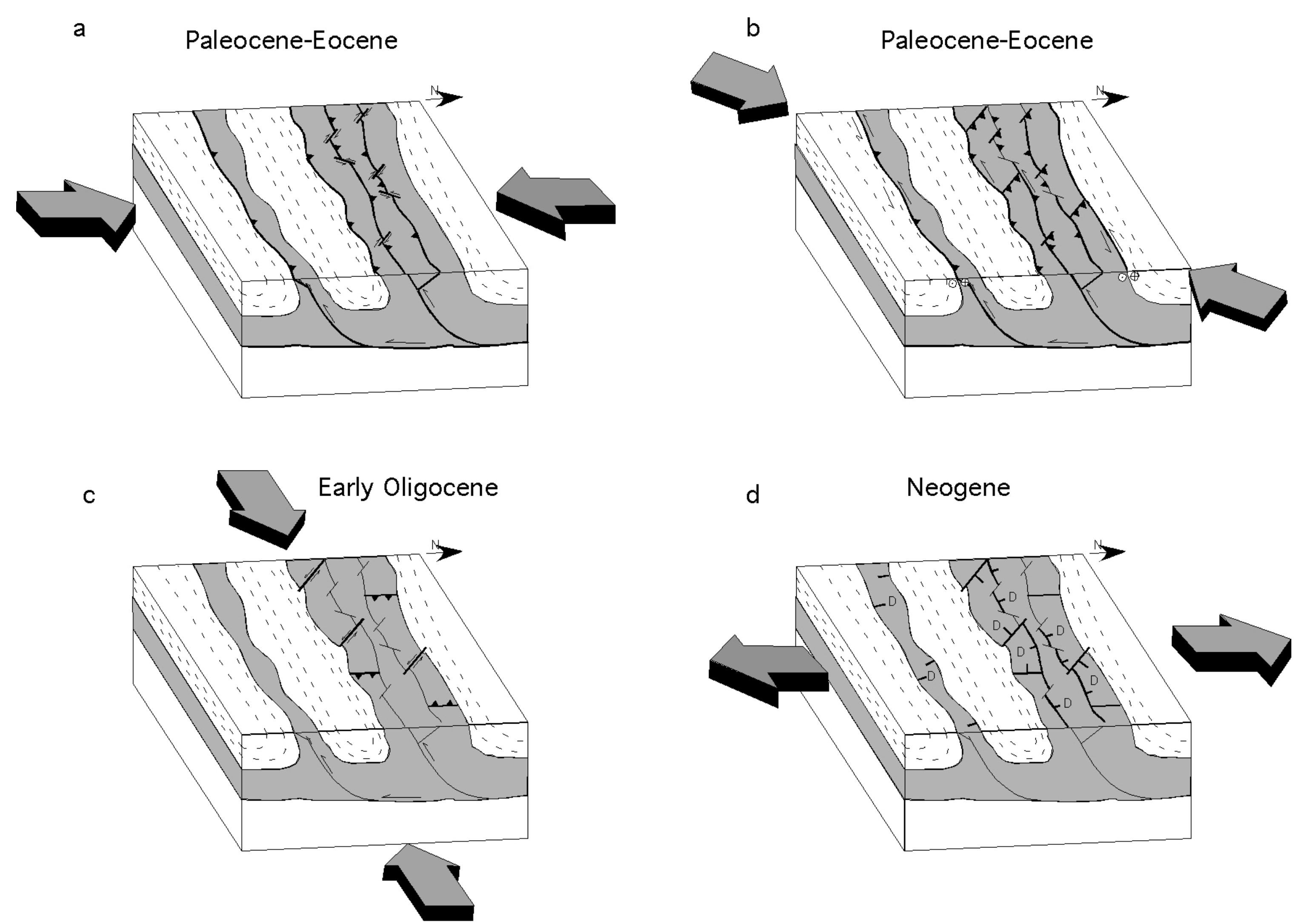


Figure 3.13: Strain development in the Monte del Estado and Río Guanajibo serpentinite. Large arrows indicate maximum horizontal strain direction. a. North-South shortening, b. Northeast-Southwest shortening, c. East-West shortening, and d. North-South extension. Heavy lines indicate active structures.

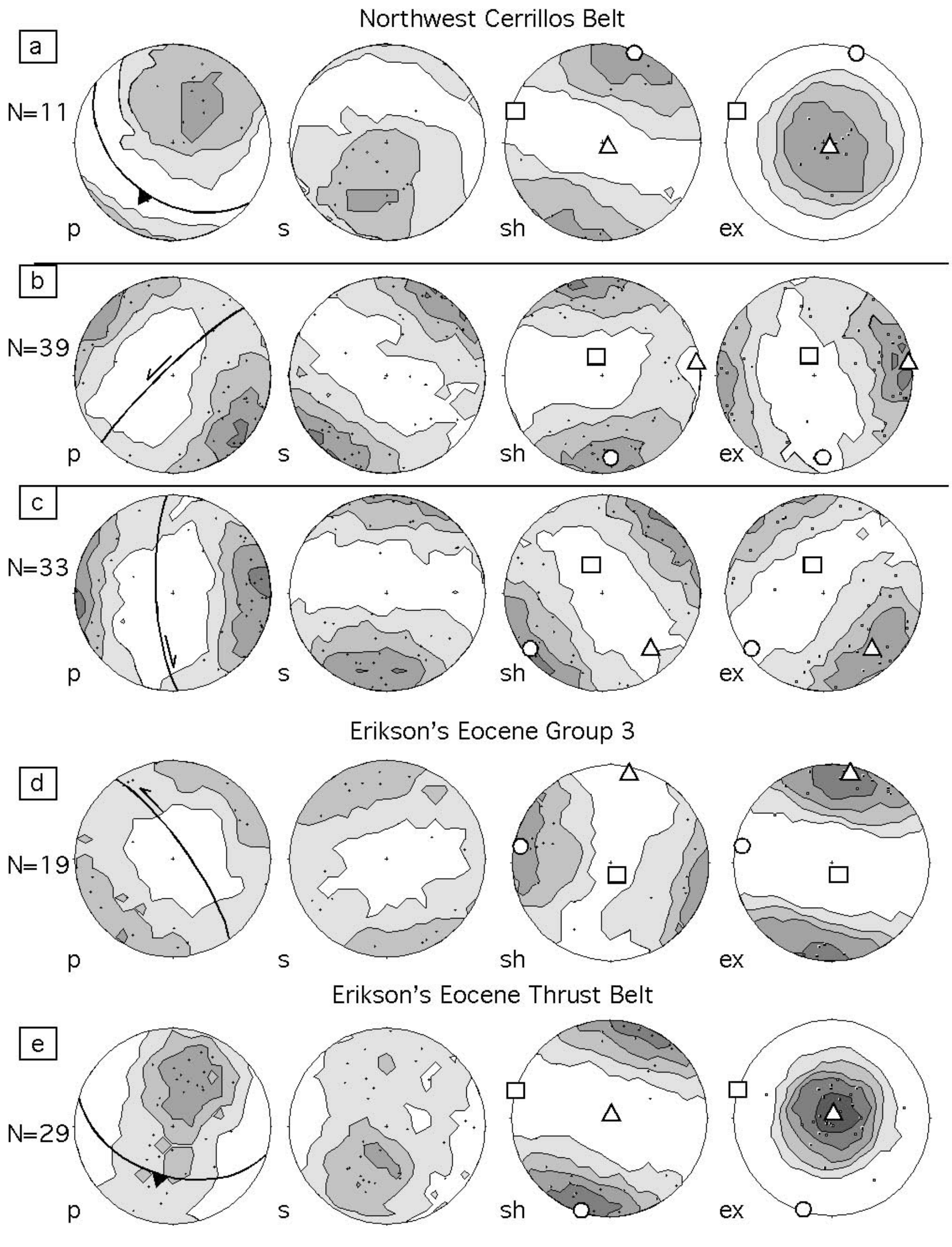


Figure 3.14: Equal-area stereographic projections of structural data in Eocene rocks of the Cerrillos belt from Laó-Dávila (2002) and Erikson et al. (1990). a. Thrust faults, b. Left-lateral faults, c. Right-lateral faults, d. Left-lateral faults in the south, e. Thrust faults in the south p = poles to C- and fault planes, s = slip directions, sh = shortening axes, ex = extension axes, ∈1 = maximum strain direction, ∈2 = intermediate strain direction, ∈3 = minimum strain direction. Contours show line concentrations. Contour interval = 2.0 sigma.

belt strain is partitioned between N-S and NE-SW shortening directions (Figure 3.14a, b, and c; Laó-Dávila, 2002). In the southern part it is partitioned between NNE-SSW and ESE-WNW shortening directions (Figure 3.14d and e; Erikson et al., 1990). Left-lateral faults in the southern Cerrillos belt have similar strain orientation to the younger E-directed deformation in the serpentinite and may be related. Older N- and NE-directed deformations are compatible with the N- and NNE-directed deformations in the northern and southern Cerrillos belt. The similarity suggests that the N-, NE- and E-directed strains recorded in the serpentinite could be correlated with the tectonic event recorded by the Eocene rocks.

Serpentinite is weaker and has more discontinuities so it shows more structures than those which the Eocene rocks show with the same tectonic deformation. Based on the serpentinite thrust relationship with the late Maastrichtian-Paleocene El Rayo formation, it is suggested that contractional deformation may have begun in the Paleocene-mid Eocene and continued on to the late Eocene-early Oligocene.

Contractional structures in the Cerrillos belt are related to transpression. Thus, we suggest that transpression related to NE-directed strain documented for the Eocene rocks of the Cerrillos belt extended all throughout southwestern Puerto Rico and was a major factor in the deformation of the serpentinite. It is mostly expressed by E-W striking left-lateral shear zones and NW-SE thrusts. This is in contrast to the view that serpentinite deformation was greatest in Late Cretaceous and related to diapirism (Mattson, 1960; Mattson and Schwartz, 1971; Volckmann, 1984b, 1984c; Jolly et al., 1998b). The youngest deformation is related to N-S extension of the serpentinite as expressed by E-W striking normal shear zones. Extension in the serpentinite can be correlated to the Miocene-Pliocene extension that occurred in western Puerto Rico (Laó-Dávila, 2002; Mann et al., 2005).

Deformational events in Puerto Rico correlate to tectonic events along the Caribbean-North American plate boundary. The oldest Paleocene-Eocene deformation consisting mostly of E-W striking thrust faults and NW-striking right lateral faults may be related to the same deformational event as recorded in Cuba and Hispaniola associated to the collision of the Caribbean plate with the Bahamas bank of the North American plate (Cobiella-Reguera, 2005; Bourdon, 1985; Joyce, 1991). After the collision of Cuba, left-lateral shearing laterally separated the Greater Antilles. Extension in the Yucatan basin and the Cayman trough may have been contemporaneous (Rosencrantz et al., 1988; Rosencrantz, 1996).

Anticlockwise rotation of ~45° of Puerto Rico along a vertical axis may have occurred as the plate boundary reorganized itself from a more orthogonal to oblique subduction (van Fossen et al., 1989). East directed maximum strain occurred as the last early Oligocene expression of transpression dominated by NW-trending left-lateral faults and accompanied by thrust faults. Contractional deformation ceased in Puerto Rico in mid Oligocene and the younger deformation is characterized by N-S extension in the Neogene (Laó-Dávila, 2002).

3.6 CONCLUSIONS

Shear zones and brittle faults recorded by the Monte del Estado and Río Guanajibo serpentinite masses in southwestern Puerto Rico include 1) NW-striking right-lateral faults and E-striking thrust faults, 2) NW-SE striking thrust faults and E-W striking left-lateral shear zones, and 3) a young group comprising N-directed thrust faults and NW-directed left-lateral faults. The N-directed shortening of the first group is probably the oldest and subsequent stress reactivated its shear planes. The shear planes from the second group suggest deformation within a transpressional regime. During development of this event the principal shortening direction was southwestward and may have later rotated to a westerly direction. Involvement of Eocene rocks indicates that the contractional and related strike-slip faults are late Eocene. Serpentinite was later affected during Neogene N-S extension that is recorded throughout western Puerto Rico.

Evidence for diapirism is not evident in the structures recorded by serpentinite. Further, serpentinite deformation in southwestern Puerto Rico differs from deformation of other serpentinite masses in the northern Caribbean. Part of Cuban serpentinites, Loma Caribe serpentinite in central Hispaniola, and Sierra Bermeja serpentinite were thrust northward in Early Tertiary. However, Monte del Estado and Río Guanajibo serpentinites in southwestern Puerto Rico show thrust faults that mostly dip NNE and thrust towards the SSW during the Early Cenozoic.

4.0 PALEOGENE THRUST EMPLACEMENT OF SERPENTINITE: IMPLICATIONS FOR THE TECTONIC HISTORY OF SOUTHWESTERN PUERTO RICO

4.1 INTRODUCTION

Serpentinite emplacement in convergent margins occurs by thrusting during the obduction of ophiolites, growth of accretionary prisms (Wakabayashi and Dilek, 2003), or by diapirism of serpentinite mud as observed in the forearc region near the Marianas Trench (Fryer et al., 1985; Oakley et al., 2007). A combination of obduction and diapirism was reported from the Coast Range Ophiolite (Page et al., 1999).

Serpentinite bodies are scattered throughout the Greater Antilles at the Caribbean-North American convergent plate boundary (Figure 4.1). In southwest Puerto Rico, three elongate masses of serpentinite and related rocks (Figure 4.2) are recognized from north to south: 1) Monte del Estado, 2) Río Guanajibo, and 3) Sierra Bermeja (Mattson, 1960). Mattson (1973) and Schellekens (1998) proposed that Sierra Bermeja, the southernmost belt, is an serpentinite mélange composed of folded chert, serpentinite, amphibolite, gneiss, schist, and metabasalt. Mattson (1973) argues that the mélange was obducted as a northward directed thrust nappe based on the southwest dip of foliation in schist, crystal foliation in serpentinite, and of axial planes in

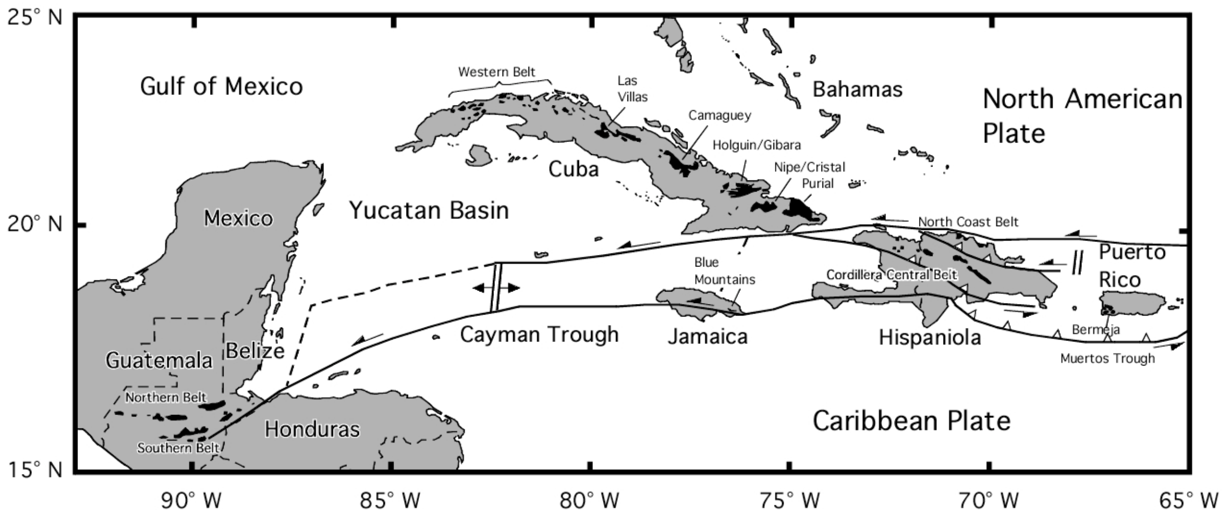


Figure 4.1: Tectonic setting of the northern plate boundary zone between the Caribbean and North American plates showing the distribution of ultramafic rocks including serpentinite (modified from Wadge et al., 1984).

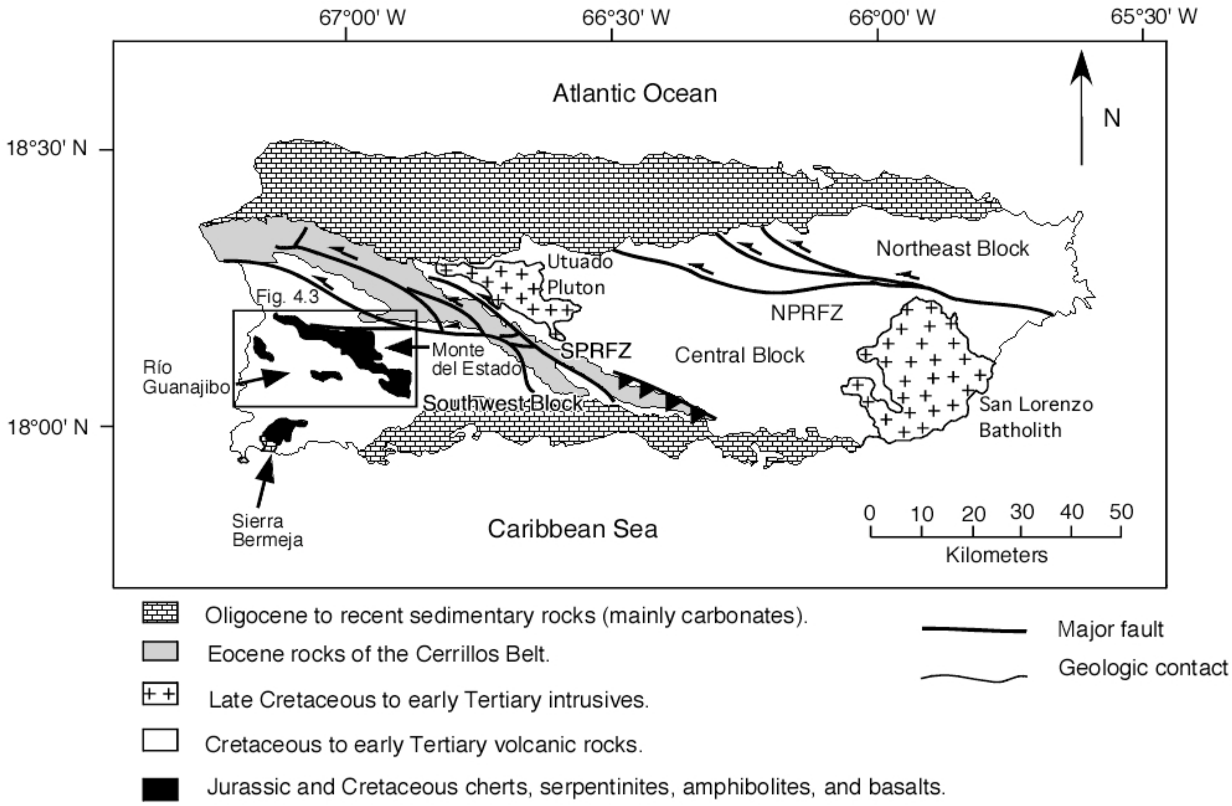


Figure 4.2: Generalized geologic map of Puerto Rico showing location of serpentinite bodies and major fault zones. The Southern Puerto Rico Fault Zone (SPRFZ) and the Northern Puerto Rico Fault Zone (NPRFZ) separate the island into three blocks (modified from Monroe, 1980).

folded chert. An Early Cretaceous collision of the Caribbean plate and the Proto-Caribbean may be responsible for the obduction of the serpentinite mélange (Mattson, 1979; Pindell, 1994). Mattson (1973) argues that the collision records a change in subduction polarity from northward- to southward-directed (present coordinates). Following emplacement, uplift and erosion of the serpentinite are postulated based upon the presence of serpentinite, amphibolite, chert, and metabasalt clasts in basal conglomerate of Late Cretaceous Yauco, Sabana Grande, and Parguera formations (Slodowski, 1956; Mattson, 1960; Mattson, 1979; Curet, 1986; Llerandi-Román, 2004). Mattson (1960) proposed that contraction may have remobilized the serpentinite in Late Cretaceous and early Tertiary, and caused upward movement of diapirs into the cores of anticlines. This hypothesis is based on 1) local steeply dipping pyroxene foliations in the Punta Guanajibo serpentinite (Mattson, 1964; Schwartz, 1970; Mattson and Schwartz, 1971), 2) vertical contacts with Late Cretaceous rocks (Mattson, 1960), and 3) inclusions of Late Cretaceous mudstone and volcanic rocks within the serpentinite (Mattson, 1960). Curet (1986) supports emplacement by diapirism and suggests that the attitudes of sedimentary rocks next to serpentinite in Monte del Estado are due to protrusion related to diapirism and not to tectonic deformation. Mattson et al. (1968) and Volckmann (1984a; 1984b; 1984c) propose diapir emplacement of Río Guanajibo and Sierra Bermeja serpentinites beginning in Late Cretaceous time and extending into the Tertiary.

Slodowski (1956) described a thrust relationship of the serpentinite with Late Cretaceous rocks. Mattson (1960) also describes thrust contacts with the serpentinite and Late Cretaceous rocks, which he attributes to later deformation. This study presents the results of examination of the previously described thrust fault contacts to reassess the question of serpentinite emplacement in southwest Puerto Rico. Detailed mapping of serpentinite structures and contacts were conducted and the results suggest thrust fault emplacement of serpentinite in southwest Puerto Rico.

4.2 REGIONAL SETTING

4.2.1 Puerto Rico

Puerto Rico, located in the northeastern Caribbean, is within the Caribbean-North America plate boundary zone (Figure 4.1). It consists of Cretaceous to Eocene volcanic and intrusive rocks with associated limestone, an Early Jurassic to Late Cretaceous ultramafic suite of rocks to the southwest, and late Tertiary gentle dipping limestone strata on the north and south coasts (Montgomery, et al., 1994a, Larue, 1994; Figure 4.2). NW-striking Northern Puerto Rico Fault Zone (NPRFZ) and the Southern Puerto Rico Fault Zone (SPRFZ) divide the island into three blocks: northeast, central, and southwest. The northeast and central blocks contain Early Cretaceous volcanic rocks, the oldest in Puerto Rico attributed to the primitive-island arc suite of rocks (Jolly et al., 2006). Two, mostly felsic, intrusions (San Lorenzo Batholith and Utuado pluton) occurred during Late Cretaceous to Early Tertiary in the central Block (Figure 4.2). The southwest block contains the serpentinite and will be the discussed below.

4.2.2 Southwest Block

Exposures of large masses of serpentinite with blocks of chert, basalt and amphibolite, folded and faulted Late Cretaceous to Eocene volcaniclastic and calcareous strata, and Late Cretaceous to early Tertiary intrusions characterize the southwest block. It is separated from the central block by the SPRFZ, which mostly occurs through the Eocene Cerrillos belt (Figure 4.2).

4.2.3 Serpentinite

Serpentinite in southwestern Puerto Rico underlies approximately 140 km^2 (Figures 4.2 and 4.3). The Monte del Estado mass is the largest and northernmost serpentinite body, extending from the Mona Passage southeastward to the municipality of Yauco close to the Caribbean Sea (Figure 4.3). The belt is widest south of the town of Maricao and reaches its highest elevation of 900 m above sea level in this region. The Río Guanajibo serpentinite is a low-lying discontinuous belt cropping out in the Guanajibo valley. Its westernmost exposure is at Mayagüez Bay and merges with the Monte del Estado belt near the town of Sabana Grande. Sierra Bermeja is a ridge that trends east-west south of the Lajas Valley and the Río Guanajibo mass. Sierra Bermeja is mostly made of folded thin-bedded chert, serpentinite, amphibolite, metabasalt, and schist. The exposure and extent of Monte del Estado and Río Guanajibo belts prompted this study on those belts.

The serpentinite in the Río Guanajibo and Monte del Estado bodies is mostly chrysotile and lizardite (Hess and Otalora, 1964; Curet, 1981) that have formed from an ultramafic protolith composed of harzburgite, dunite, and spinel lehrzolite (Mattson, 1964; Schwartz, 1970; Curet, 1981; Lewis et al., 2006b). Fragments of amphibolite, schist, metabasalt, and chert are included within the serpentinite in the three belts (Schellekens, 1998), however, they are most abundant in Sierra Bermeja.

Aeromagnetic and gravity surveys suggest that the northeast contact of the Río Guanajibo serpentinite dips ~50° to the NE, that the SW contact is steeper, and that the serpentinite mass

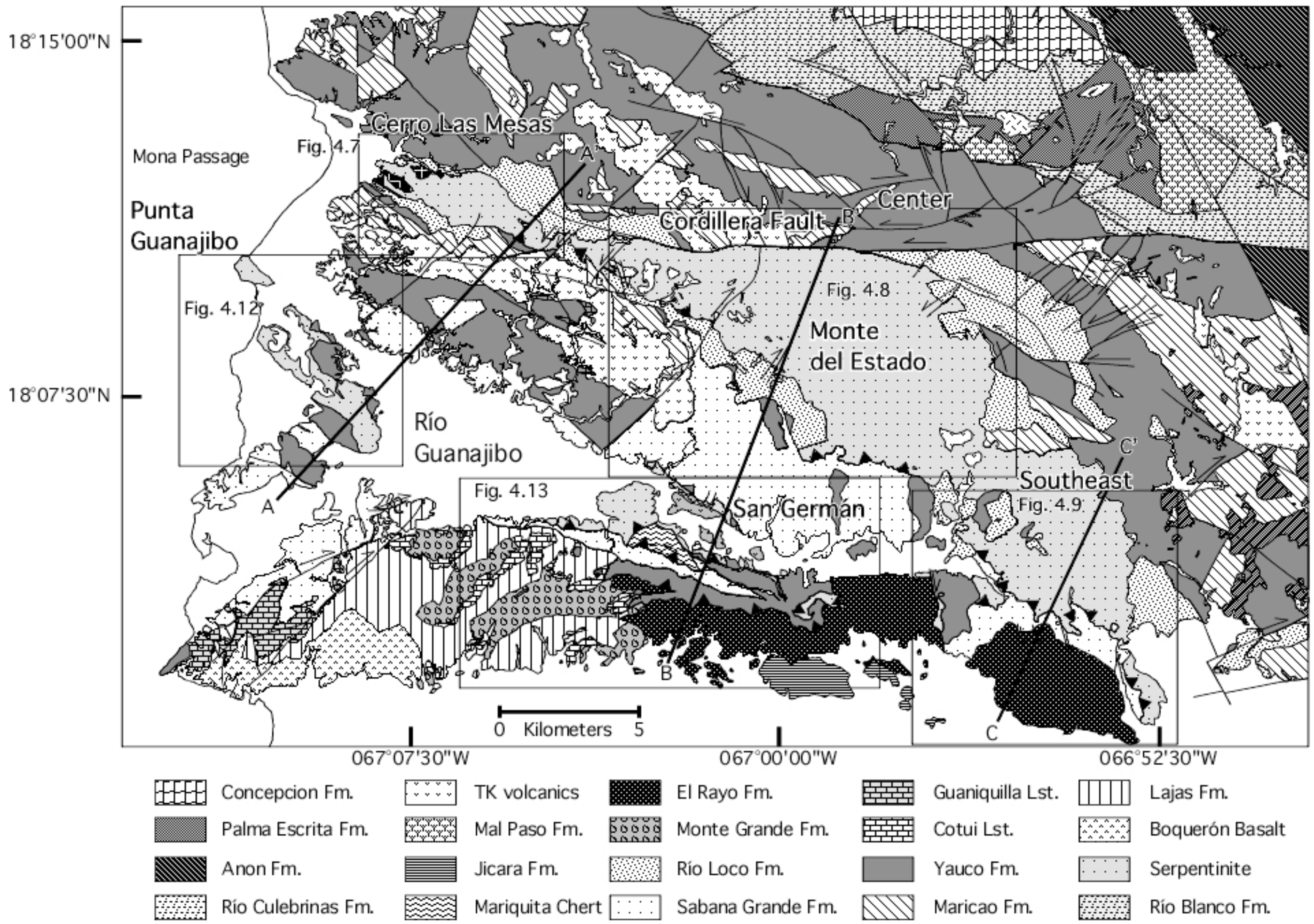


Figure 4.3: Geologic map of southwestern Puerto Rico (modified from McIntyre, 1975; Krushensky and Monroe, 1978; Volckmann, 1984a, 1984b, 1984c; Curet, 1986; Martínez-Colón, 2003; Llerandi-Román, 2004). Heavy lines are faults with dark triangles on hanging wall of thrust fault. Lighter lines are geological contacts. Cross-sections for transects A-A', B-B', and C-C' are shown in Figure 4.17. Rectangles indicate domains areas.

extends to a depth of at least 2,800 m (Griscom, 1964; Bromery and Griscom, 1964). Bromery and Griscom (1964) suggest that the Monte del Estado and Río Guanajibo serpentinites comprise a single mass that joins in the subsurface.

4.2.4 Stratigraphy of volcanic and sedimentary rocks overlying the serpentinite

Late Cretaceous and early Tertiary formations overlie the serpentinite (Figure 4.4). The Campanian to Maastrichtian Yauco Formation is an extensive unit overlying serpentinite on the north that comprises interbedded medium- to thin-bedded volcaniclastic and calcareous mudstone, sandstone, and minor conglomerate with less common fragmental limestone, tuff, and bedded chert (Slodowski, 1956; Mattson, 1960; Mattson, 1967; McIntyre, 1970; Krushensky and Monroe, 1979; Volckmann, 1984d). Tuffaceous units and grain size increase towards the northeast close to the Eocene age Cerrillos belt (Curet, 1981; Larue, 1991). Soft-sediment deformation (e.g. load casts, slump folds) is common (Curet, 1981). Calcareous mudstone, rich in planktonic foraminifera and radiolaria of Campanian to Maastrichtian age, indicate the age of the formation (Slodowski, 1956; Mattson, 1960; Pessagno, 1960; Pessagno, 1962, McIntyre, 1970; Curet, 1981). Slodowski (1956), Mattson (1960), McIntyre (1970), and Curet (1981) gave estimates for the thickness of the Yauco Formation that range from 500-2,800 m. Larue (1991) recognized different facies tracts within the Yauco Formation and describes these as part of an outer fan north of Monte del Estado, slope facies east of Monte del Estado near the town of Yauco, and submarine fan further east near Ponce. In southwest Puerto Rico, the Yauco formation was deposited over sedimentary rocks composed mostly of serpentinite (Curet, 1981; Volckmann, 1984d). Llerandi Román (2004) and Martínez Colón (2003) described basal

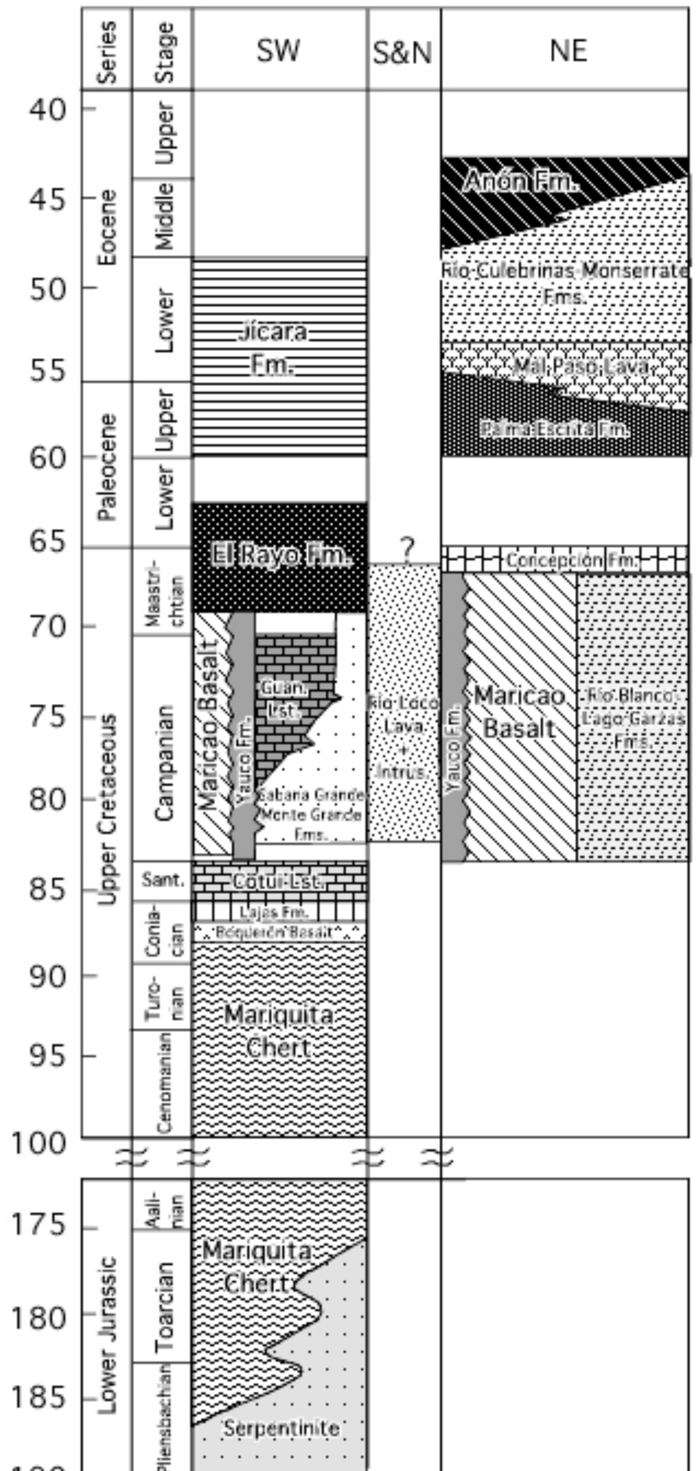


Figure 4.4: Stratigraphic column for southwestern Puerto Rico, southwest and northeast of Monte del Estado (modified from Jolly et al., 1998b; Santos, 1999; Santos, 2005). Guan = Guaniquilla.

conglomerate containing amphibolite, chert, serpentinite and volcanic clasts in the contact on top of the serpentinite in the southeastern area of Monte del Estado serpentinite. Mattson (1960) stated that in places the Maricao Formation is lenticular within the Yauco Formation. The Sabana Grande Formation is interbedded with the Yauco Formation south of Monte del Estado (Curet, 1981; Volckmann, 1984d).

The Sabana Grande Formation consists of andesitic volcanic breccia and lava flows, conglomerate, graded sandstone, minor calcareous mudstone, locally basaltic lava, rare bedded and graded tuff, and limestone lenses (Slodowski, 1956; Mattson, 1960; Curet, 1981; Volckmann, 1984d). Most of the formation is massive, however, bedding is visible in the conglomerates and mudstones. The base of the formation, near Punta Guanajibo and near the southern contact of Monte del Estado, contains lenses of poorly sorted conglomerate of rounded to subangular pebbles and cobbles of volcanic rock, chert, amphibolite, and serpentinite (Slodowski, 1956; Mattson, 1960; Llerandi Román, 2004). Curet (1981) and Llerandi Román (2004) state that the Sabana Grande Formation and the Yauco Formation are interbedded. The age of the Sabana Grande Formation has been suggested as Campanian to early Maastrichtian based on rudists and on the speculative stratigraphic position of Sabana Grande Formation under El Rayo Formation (Figure 4.4; Curet, 1981; Volckmann, 1984d; Llerandi Román, 2004). However, other studies suggest ages of Turonian to early Maastrichtian based on foraminifera, radiolaria, and stratigraphic relationships with Yauco Formation (Slodowski, 1956; Mattson, 1960; Volckmann, 1984d). For this study, an age of Campanian to early Maastrichtian will be used as it is the time frame overlapped by most studies and because it shows the interbedded relationship with the Yauco Formation.

The Maricao Formation is composed of massive basaltic breccia, tuff, basalt lava flows and minor volcaniclastic sandstone and conglomerate (Mattson, 1960; McIntyre et al., 1970; Curet, 1981). The minimum thickness of the formation is estimated to be 1,000-1,400 m (McIntyre, 1970; Curet, 1981). Although no fossils were observed, the interbedded relationship with the Yauco Formation indicates that the Maricao Formation is Campanian to Maastrichtian (Mattson, 1960; McIntyre, 1970; Curet, 1981).

The Río Loco Formation consists of volcanic flows and shallow intrusions (also known as two-pyroxene basalt) that contain plagioclase, orthopyroxene, and clinopyroxene. These rocks were originally described as basaltic andesite pillow lava flows that were deposited on top of the serpentinite and before the deposition of the Yauco Formation (Slodowski, 1956; Mattson, 1960). Later studies indicated that few pillow lavas occur and they are mainly towards the east close to the southeast margin of Monte del Estado (Martínez Colón, 2003; Llerandi Román, 2004). Mapping by Krushensky and Monroe (1979), Curet (1981), Volckmann (1984c), Martínez Colón (2003), and Llerandi Román (2004) indicates a mostly intrusive relationship of the basaltic andesite with the Yauco Formation and the Monte del Estado serpentinite. The basaltic andesite cuts beds of Yauco Formation and contains xenoliths of mudstone and serpentinite (Curet, 1981; Martínez Colón, 2003; Llerandi Román, 2004). Furthermore, silicified slivers of the Yauco formation occur between the serpentinite and the basaltic andesite, and gabbroic dikes cut the serpentinite (Curet, 1981; Martínez Colón, 2003; Llerandi Román, 2004). Thus, the emplacement of the Río Loco Formation is interpreted as a shallow intrusion that cuts the Yauco Formation and the serpentinite with an extrusive pillow lava correlative that rests upon the serpentinite. The age is believed to be Campanian or younger based on its intrusive relationship with the Yauco Formation (Curet, 1981; Volckmann, 1984c; Llerandi Román, 2004; Jolly et al., 2007).

The El Rayo Formation consists of massive to thin-bedded limestone composed of rudist fragments interlayered with basaltic and andesitic lava, breccia, and volcaniclastic conglomerate and sandstone (Slodowski, 1956; Mattson, 1960; Volckmann, 1984d; Santos, 1999; Martínez Colón, 2003; Llerandi Román, 2004). The formation is steeply tilted and may be conformable with the underlying Sabana Grande Formation (Slodowski, 1956). The Jicara Formation structurally overlies the El Rayo Formation with an angular unconformity or along a thrust fault (Slodowski, 1956; Llerandi Román, 2004). The age of El Rayo Formation is Maastrichtian to early Paleocene based on rudists within the limestone lenses and on stratigraphic relations (Volckmann, 1984d; Santos, 1999; Santos, 2005).

The Jicara Formation is composed of thin- to medium-bedded calcareous and siliceous sandstone, siltstone, and mudstone (Slodowski, 1956; Pessagno, 1960; Mattson and Pessagno, 1971). The thickness of the formation is estimated to be 440 to 1000m (Slodowski, 1956; Llerandi Román, 2004). The formation shows common slumps and disharmonic folds (Llerandi Román, 2004). An open syncline with fold axis that trends N60°W and plunges to the SE characterizes the Jicara Formation (Slodowski, 1956; Llerandi Román, 2004). The formation overlies with angular unconformity or with a thrust fault the El Rayo Formation (Mattson, 1960; Volckmann, 1984c; Llerandi Román, 2004). Foraminifera and radiolaria suggest a late Paleocene-Eocene age for the Jicara Formation (Pessagno, 1960). Early Tertiary intermediate intrusions cut the serpentinite and Late Cretaceous rocks.

4.3 CONTACT RELATIONS

4.3.1 Methods

In this study, contacts of serpentinite with Late Cretaceous rocks were examined to determine the emplacement mechanism of the serpentinite. Furthermore, regional structures within the serpentinite were mapped. Shear zone and fault kinematic analyses from within the serpentinite were presented in Laó-Dávila and Anderson (submitted). Herein we describe serpentinite textures, foliations, and contacts with Late Cretaceous rocks. Data was collected from all exposed contacts of the Monte del Estado and Río Guanajibo serpentinite. These data are presented for every geographic domain in the Monte del Estado and Río Guanajibo belts. Orientation data for folds, bastite foliation and lineation are presented in Figure 4.5. A road map for the study area is presented in Figure 4.6.

4.3.2 Monte del Estado

Serpentinite texture within the Monte del Estado belt may be massive, foliated, and/or brecciated (after O'Hanley, 1996). Massive serpentinite, which shows the least deformation of the serpentinite textures, commonly contains bastites that define lineation and foliation (Figures 4.7a and 4.7b). Kernel pattern (Figure 4.7c), joints, serpentine veins, and striations on polished surfaces are also common. Blocks of massive serpentinite commonly are surrounded by foliated serpentinite.

Foliated serpentinite can be divided into mylonite, schist, and cataclasite (O'Hanley, 1996). Cataclasite consists of phacoids, which are lenses of serpentinite surrounded by

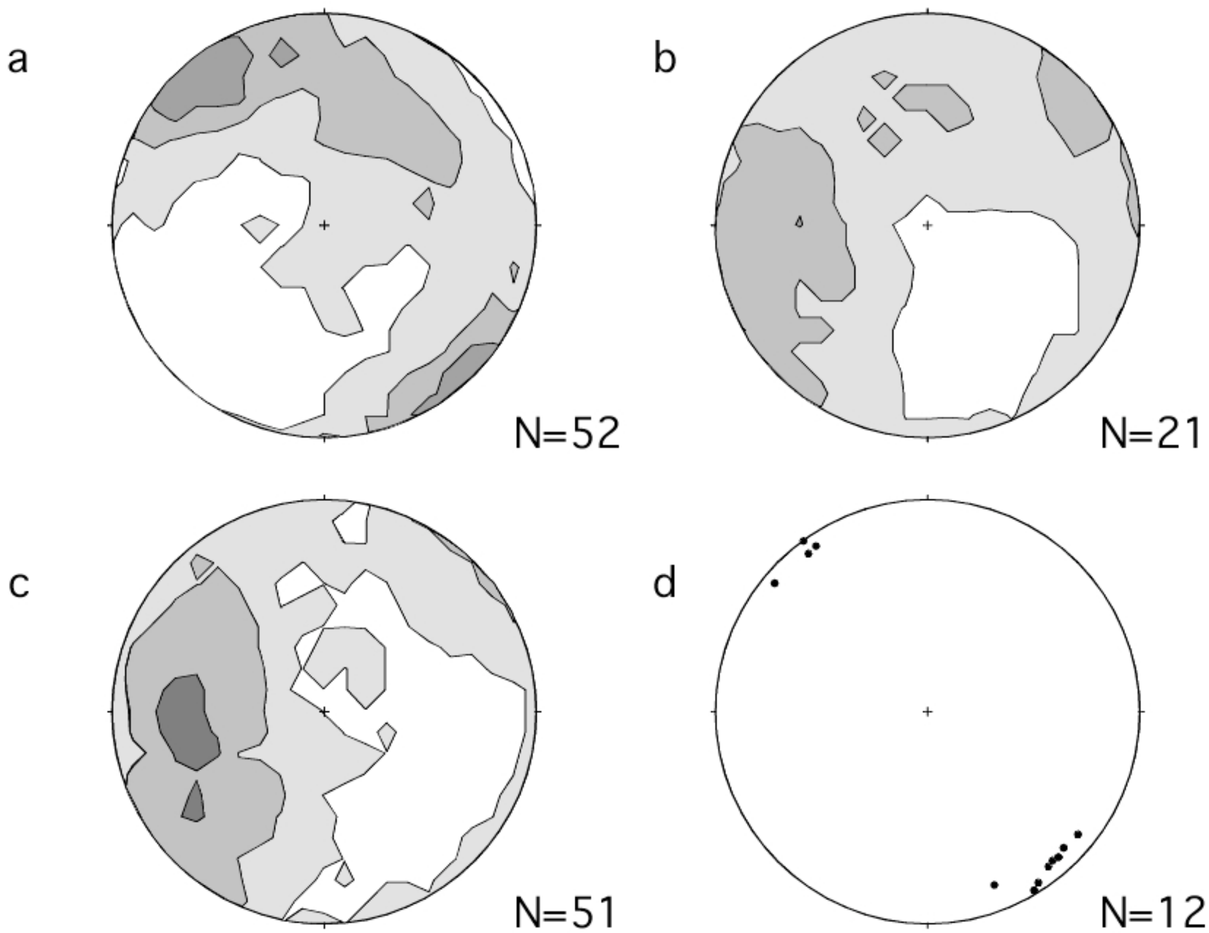


Figure 4.5: Equal-area stereographic projections. a. Kamb contour of Fold hinges of folded foliations in serpentinite. b. Kamb contour of poles to axial planes. c. Bastite foliations relict from peridotite. d. Bastite lineations relict from peridotite in Punta Guanajibo serpentinite.

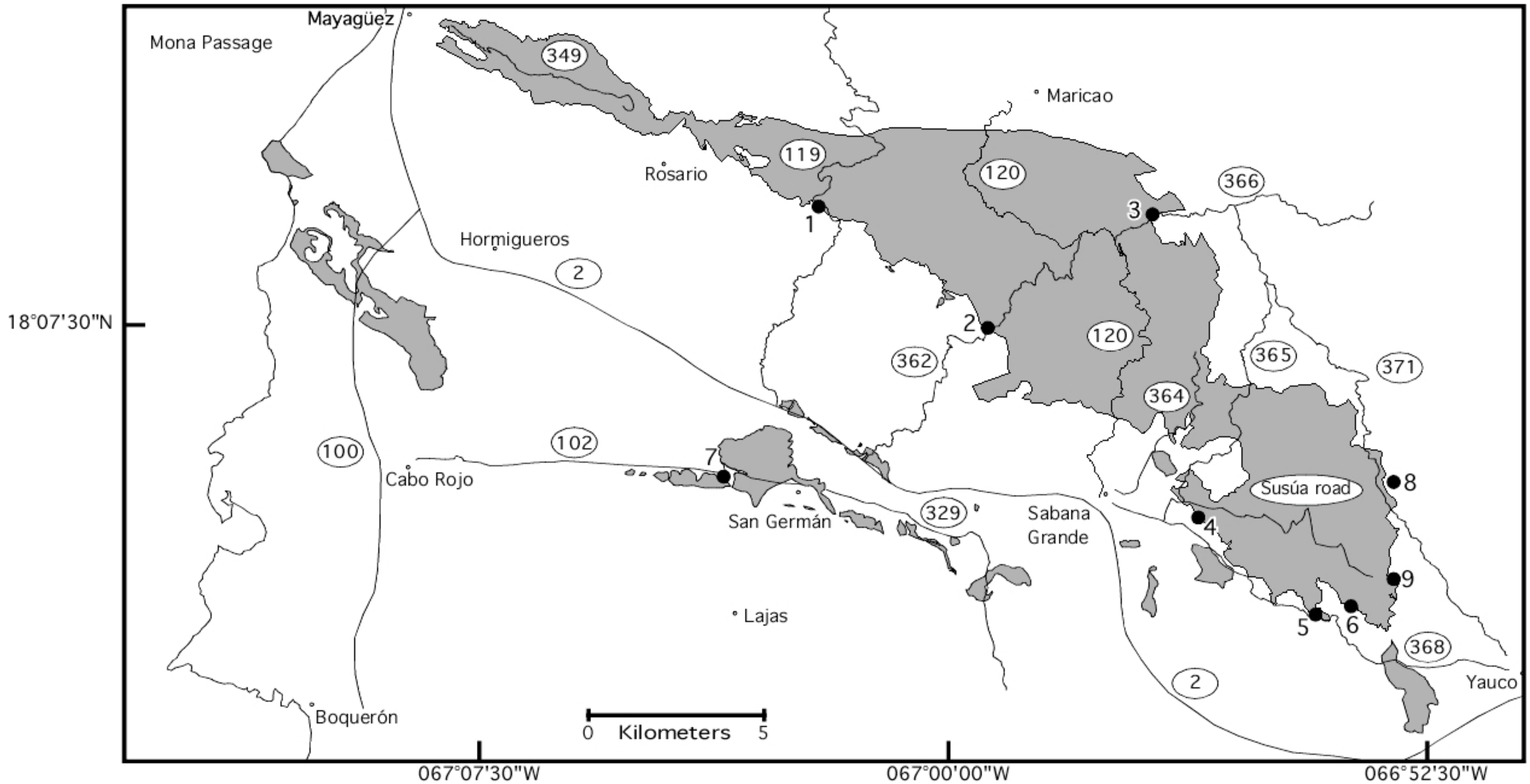


Figure 4.6: Map showing roads that pass through the study area. Closed circles and numbers refer to locations indicated in the text.

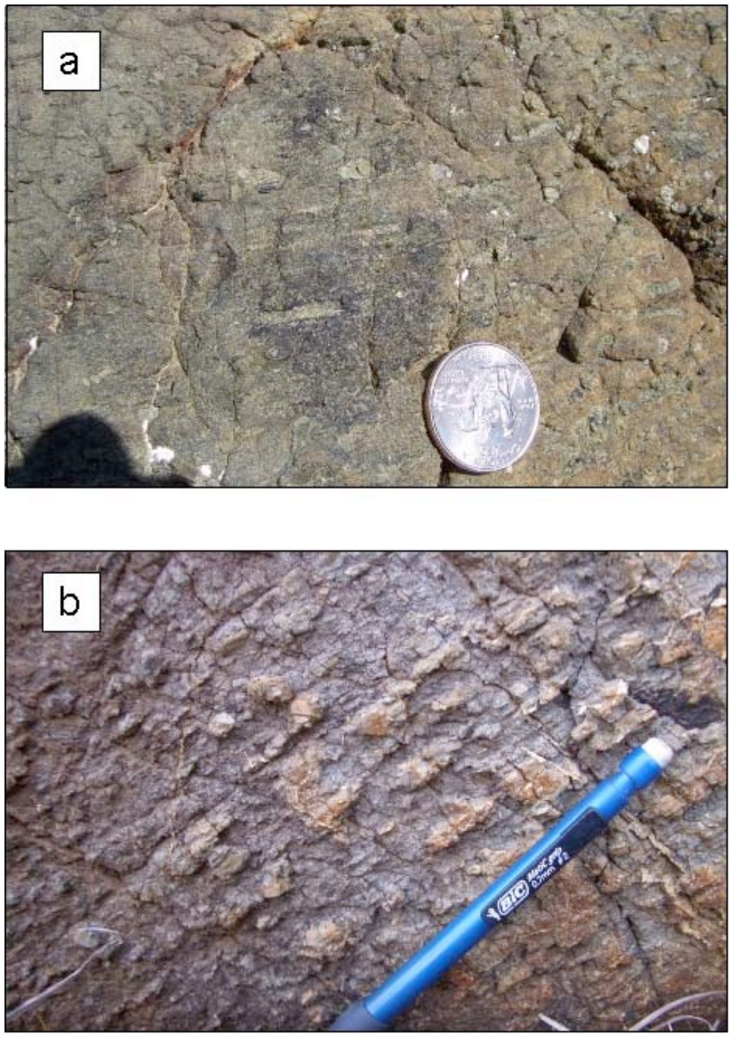


Figure 4.7: Mesoscale serpentinite structures. a) L-tectonite defined by elongated bastites. b) Bastite layering. c) Core-and-rim pattern. d) Serpentine foliation. e) Breccia and fault plane. f) Folded serpentine foliation. g) Matrix supported conglomerate of serpentinite clasts and matrix. h) Porphyroclast within serpentinite matrix.

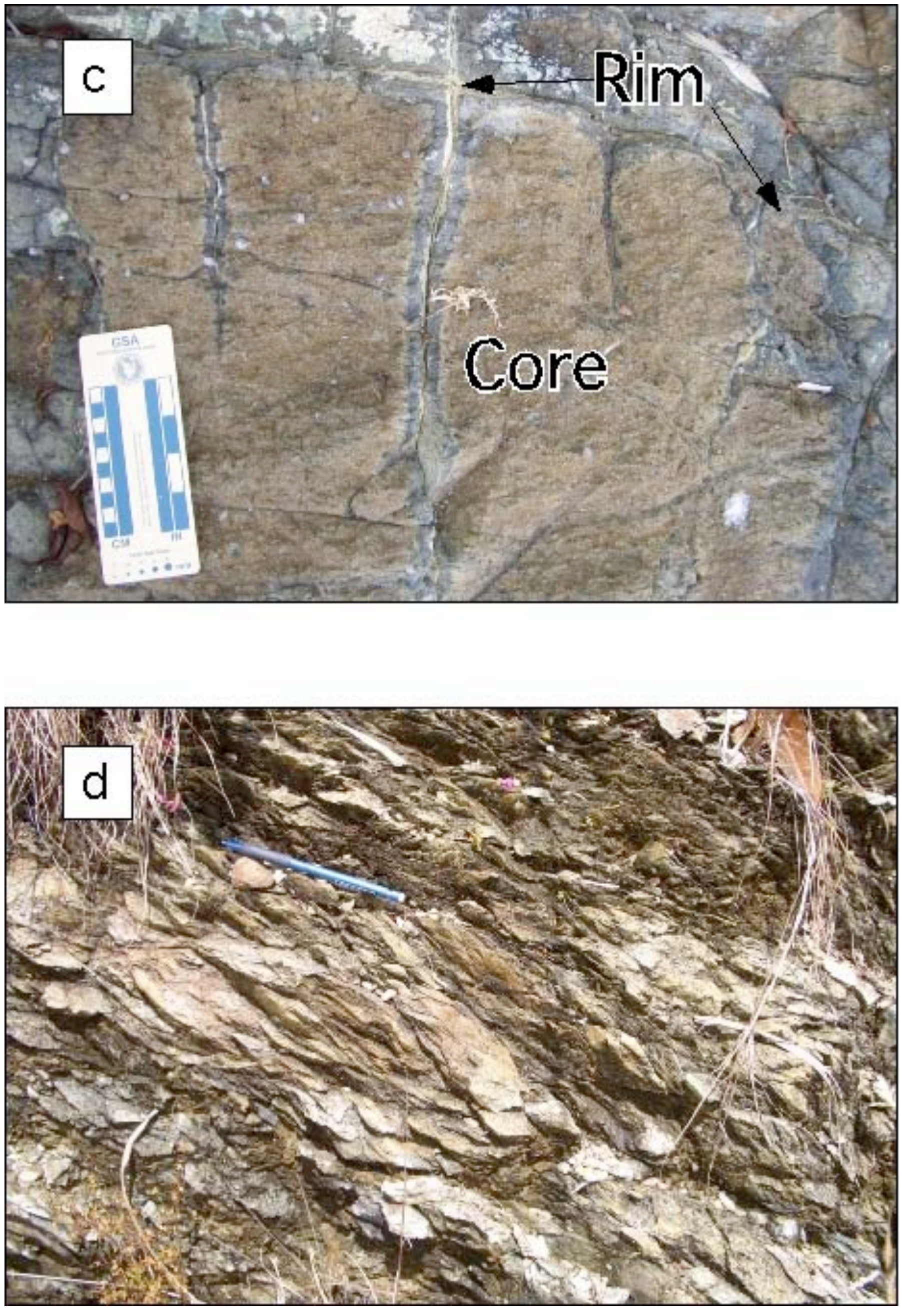
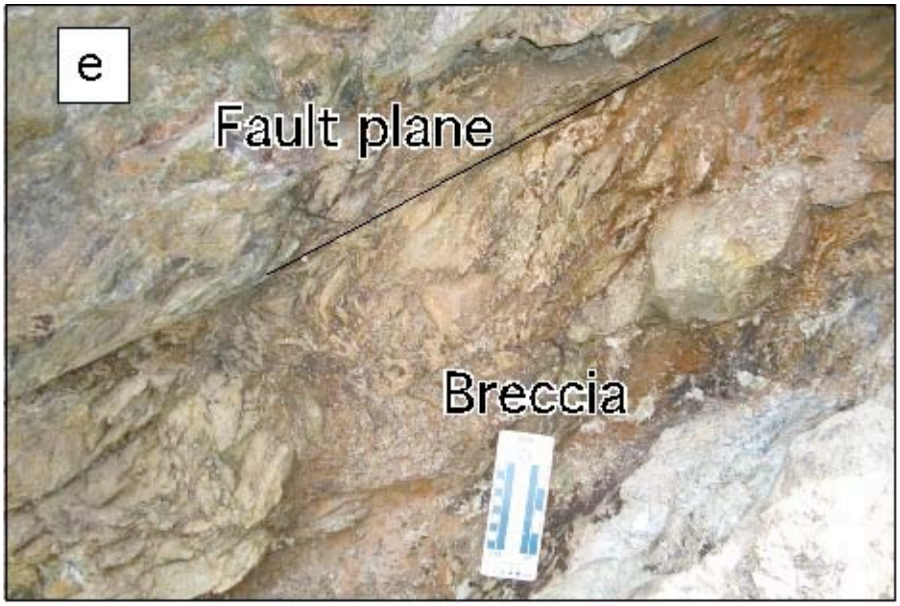


Figure 4.7 (continued)



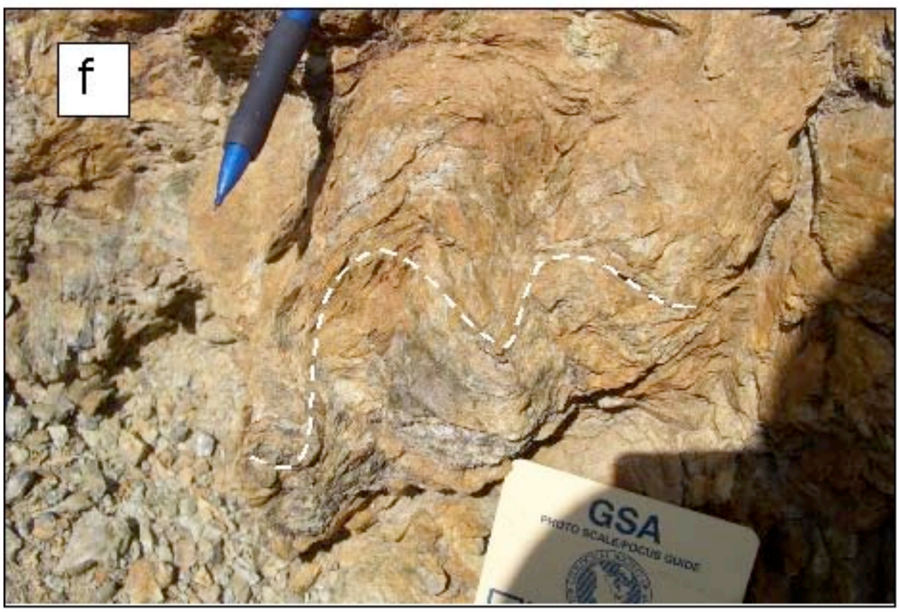


Figure 4.7 (continued)

Figure 4.7 (continued)

serpentine foliations. Some striations may occur on the sides of the serpentinite lenses indicating slip around the lenses. Though all types of foliated serpentinite occur in the study area, schistose and phacoidal foliation are the most common. They are defined by alignment of fine-grained serpentine minerals (Figure 4.7d).

Matrix-supported conglomerate and breccia, made mostly of serpentinite clasts, occur within fault zones cutting the serpentinite (Figure 4.7e). Brecciated serpentinite occurs inresponse to brittle deformation. Subrounded to angular pebbles to boulders of sandstone, volcanic rock, and mudstone are found within the serpentinite. Some of their contacts with the serpentinite show signs of serpentinization, probably related to metasomatism (O'Hanley, 1996). Dikes of rodingite, intermediate, and mafic composition cut the serpentinite. The following geographic domains within the Monte del Estado belt are described below: Cerro Las Mesas, Center, and Southeast (Figure 4.3).

4.3.2.1 Cerro Las Mesas domain

Cerro Las Mesas is the narrow (2.2 km wide) westernmost part of the Monte del Estado body (Figure 4.8). The serpentinite is schistose containing subrounded to angular clasts of serpentinite, although massive serpentinite occurs to a lesser extent. Locally, light-green serpentinized dunite clasts up to 1 meter long occur within the serpentinite. The serpentinite matrix consists of clay to sand-sized grains. Northwest-striking thrust and left-lateral shear zones, and serpentine foliations predominate in this domain (Figure 4.8). Many low angle faults are oblique and show transport direction toward the southwest. Foliation may record folds along faults (Figure 4.7f).

A fault contact separates the Río Loco Formation and the serpentinite in the northeast margin of Cerro Las Mesas near the town of Rosario. Breccia comprised of serpentinite and

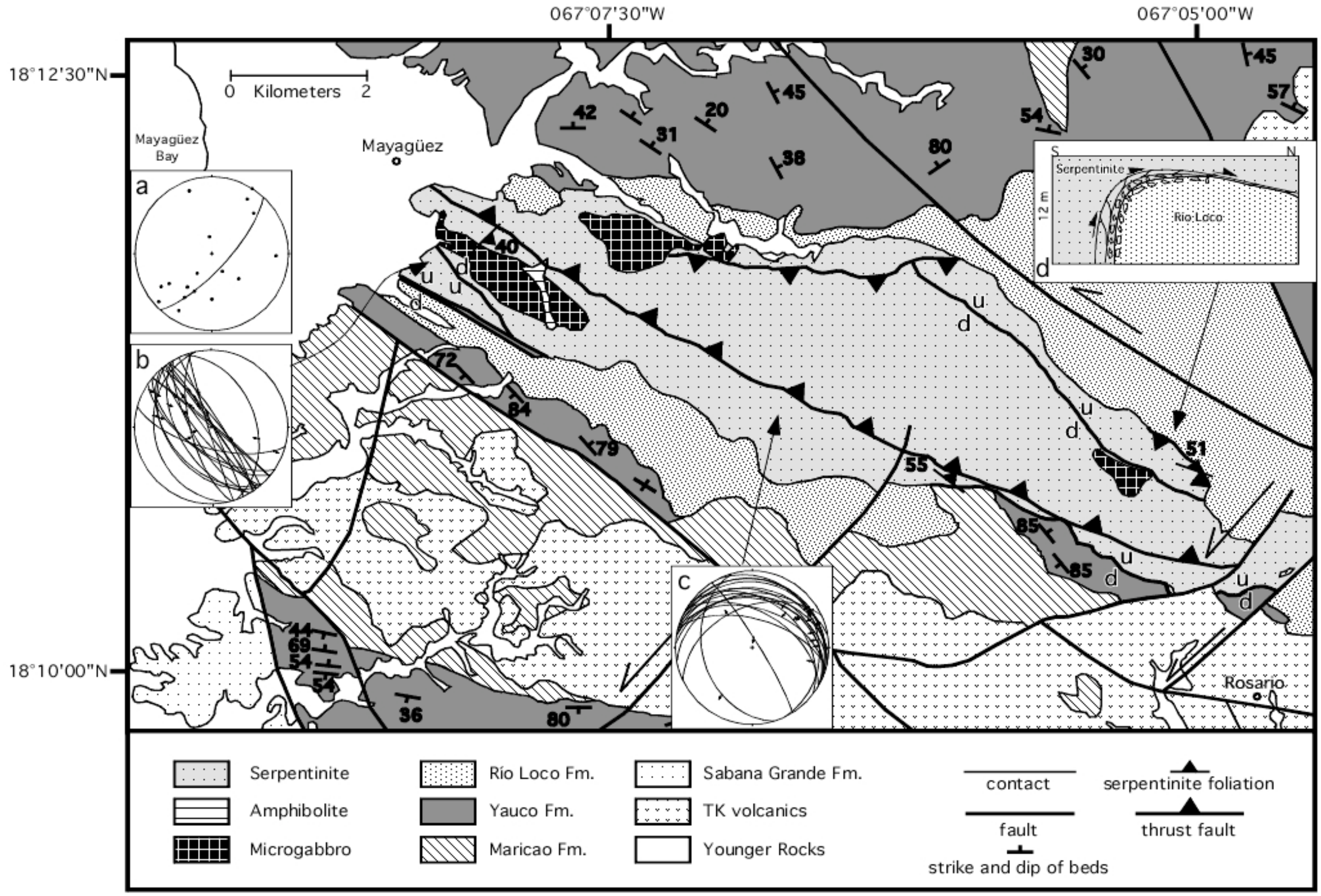


Figure 4.8: Geologic map of Cerro Las Mesas (modified from Curet, 1986). a. Poles to serpentine foliations with great circle showing cylindrical best fit. b. Left-lateral and reverse shear zones at the NW corner of the serpentinite. c. Oblique shear zones near the southern margin showing top to SW sense. d. Sketch of cross-section of NE contact relationships.

another breccia consisting of basalt clasts characterize the contact. Moreover, S-C fabrics in the serpentinite at the contact indicate a top to the northeast thrust movement of the serpentinite over the Río Loco Formation. The fault contact is steep but its dip changes to subhorizontal at higher elevation and towards the northeast (Figure 4.8d). Contacts of the serpentinite with the other formations are not well exposed in this area.

A matrix supported conglomerate made of serpentinite, underlies massive serpentinite, and occurs at the southern contact of Cerro Las Mesas serpentinite with the Maricao and Yauco formations (Figure 4.7g). Here the serpentinite may overly the Yauco and Maricao formations. Foliation within the matrix of the conglomerate strikes northwest and dips to the northeast. A thrust fault contact was described at the southwest margin of Cerro Las Mesas with the Yauco Formation (Mattson, 1960).

4.3.2.2 Center domain

The center domain is south of the Cordillera Fault and encompasses the largest area of the Monte del Estado serpentinite mass (Figure 4.9). Massive serpentinite predominates, although phacoids in schistose matrix, and breccia are common. Porphyroclasts of less serpentinized peridotite are included within the schistose serpentinite (Fig 4.7h). Thrust faults strike NW and show kinematic transport to the SW. Left-lateral faults strike E, and right-lateral faults and serpentine foliations strike NW (Figure 4.9).

The Cordillera Fault bounds the northern margin of the Center domain. Adjacent to this fault, poles to serpentine foliations trend along a NNE-SSW striking girdle (Figure 4.9). East striking thrust, left-lateral, and oblique faults, and NW striking thrust faults are also abundant in this region. The Cordillera Fault is the contact between the serpentinite and the northern Late Cretaceous rocks (McIntyre, 1975). Serpentinite breccia with foliated matrix is subvertical and

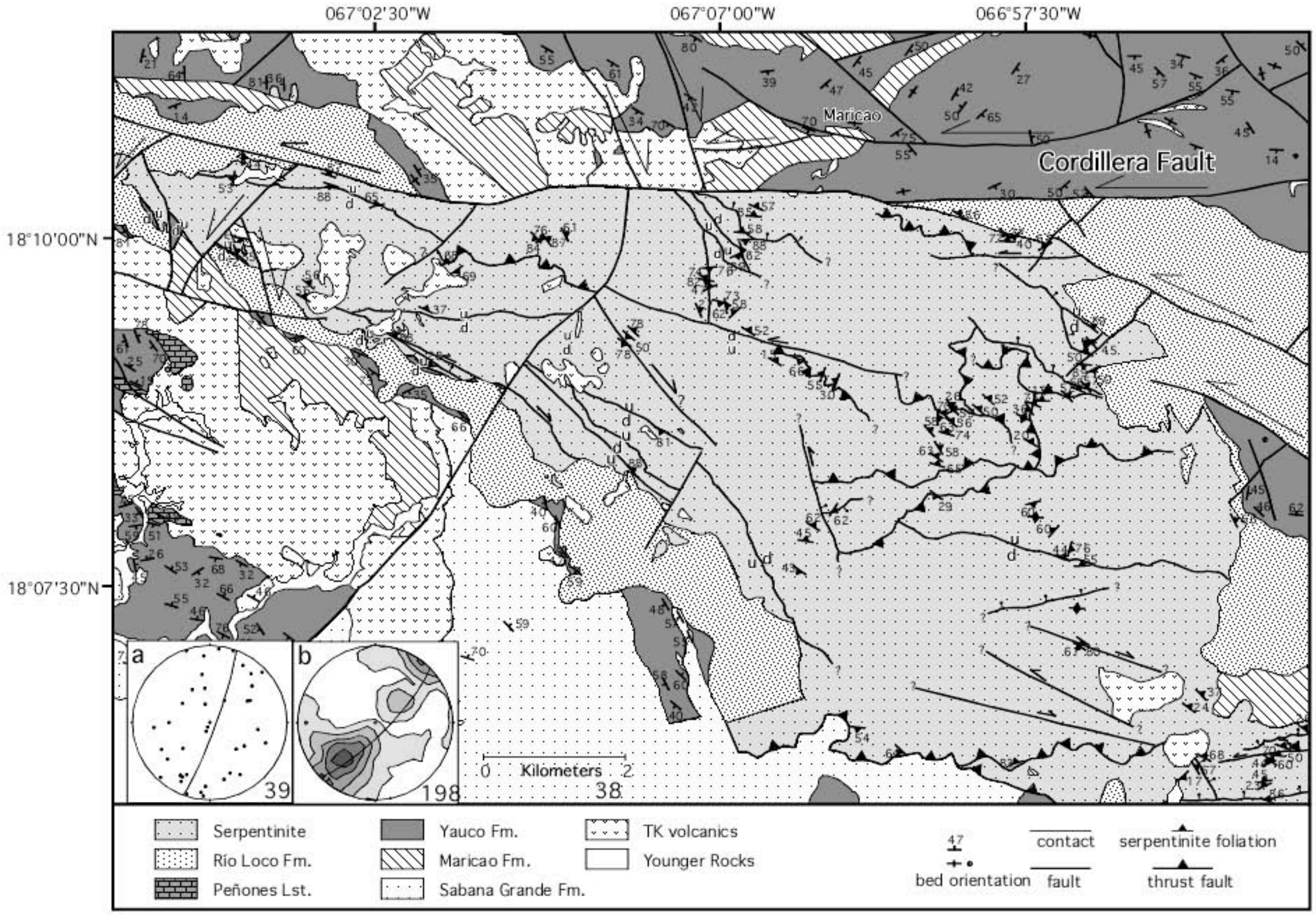


Figure 4.9: Geologic map of the Center domain (modified from McIntyre, 1975; Curet, 1986). a. Poles to serpentine foliations near the Cordillera Fault. Great circle is cylindrical best fit. b. Poles to serpentine foliations in the Center domain excluding those close to the Cordillera Fault. Great circle is cylindrical best fit.

occurs within faults close to the margin. Displaced plutons indicate that left-lateral offset along the Cordillera Fault is at least 10 km (McIntyre, 1975). In the study area, the contact is not well exposed.

At the southwest margin, the Monte del Estado serpentinite has a steep contact with the Yauco Formation as shown by mudstone dipping steeply (70°-82°) to the northeast. At the contact a purple serpentine-mud supports bastite-bearing sand to gravel sized clasts. Along Road 119, a matrix-supported conglomerate containing subrounded serpentinite boulders (1 meter long) within foliated serpentinite matrix occurs at the contact with the Yauco Formation (1 on Figure 4.6). Next to the conglomerate, massive serpentinite contains polished and striated pebbles to boulders within phacoidal foliations and is cut by 0.5 cm wide shear zones that dip steeply to the northeast. Here the Yauco Formation dips moderately to the northeast. At the contact with the Río Loco Formation along Road 362, there is massive dark-green-grey serpentinite with polished and striated surfaces (2 on Figure 4.6).

At the southern margin, the contact with the Sabana Grande Formation is not exposed. However, foliated serpentinite exposure close to the contact with the Sabana Grande Formation dips gently suggesting that it is shallow (Llerandi-Román, 2004). Blocks of Sabana Grande Formation occur within the serpentinite. A sub-vertical contact with a small body of basalt from the Río Loco Formation is sharp and interpreted as a fault.

The eastern contact of the serpentinite with the Río Loco Formation is best exposed at a coffee and banana plantation close to Road 366 in Maricao (3 on Figure 4.6). Serpentinite is massive, polished, striated, and contains bastites and 1 cm thick serpentine veins. Fault breccia is composed of subrounded to subangular sand and cobbles that have long axes aligned with phacoidal foliation. Serpentinite is sheared close to contact with Río Loco Formation, and

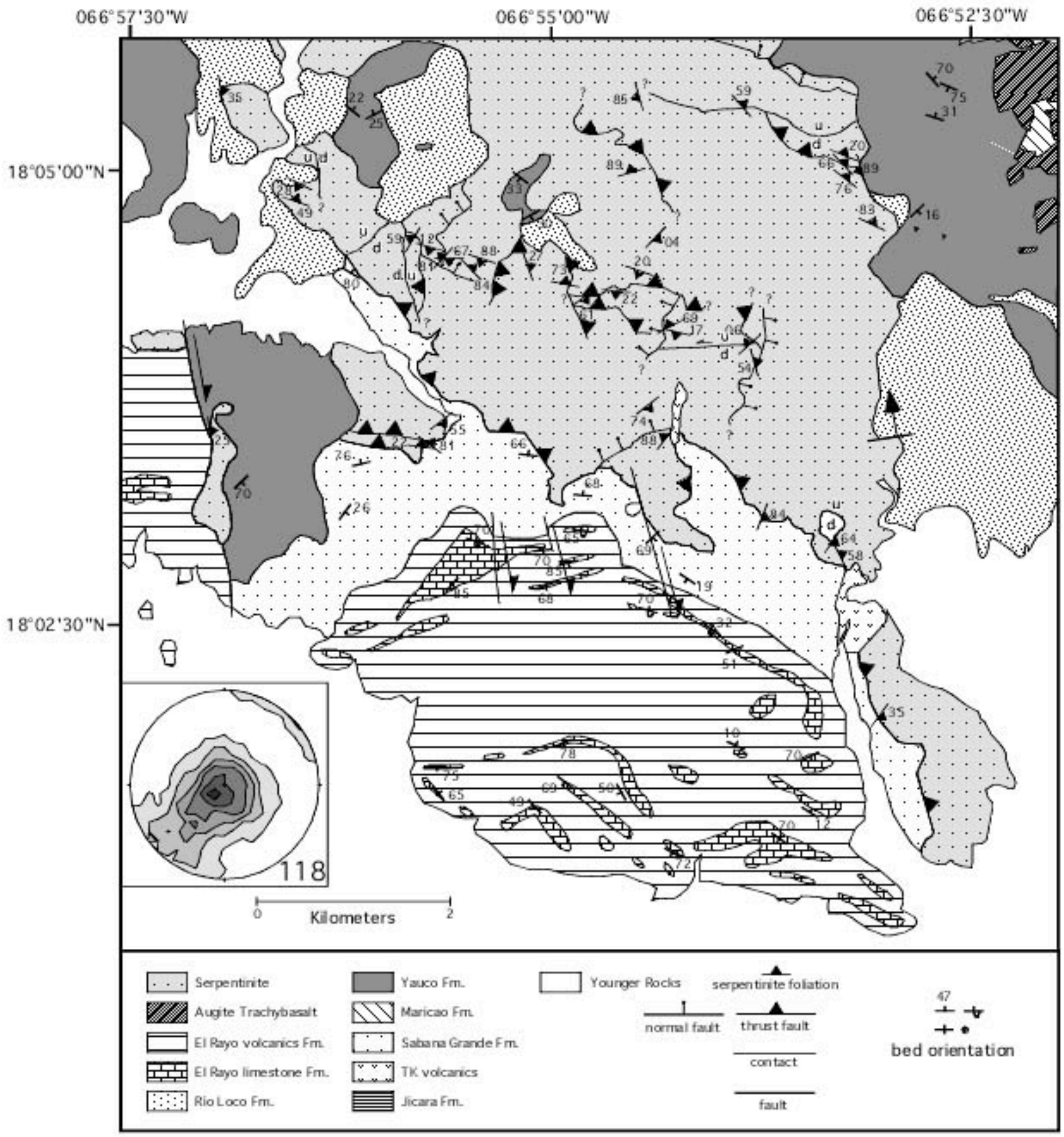


Figure 4.10: Geologic map of the Southeastern Monte del Estado area (modified from Krushensky and Monroe, 1978; Martínez-Colón, 2003; Llerandi-Román, 2004). Inset shows Kamb contoured poles to serpentine foliations.

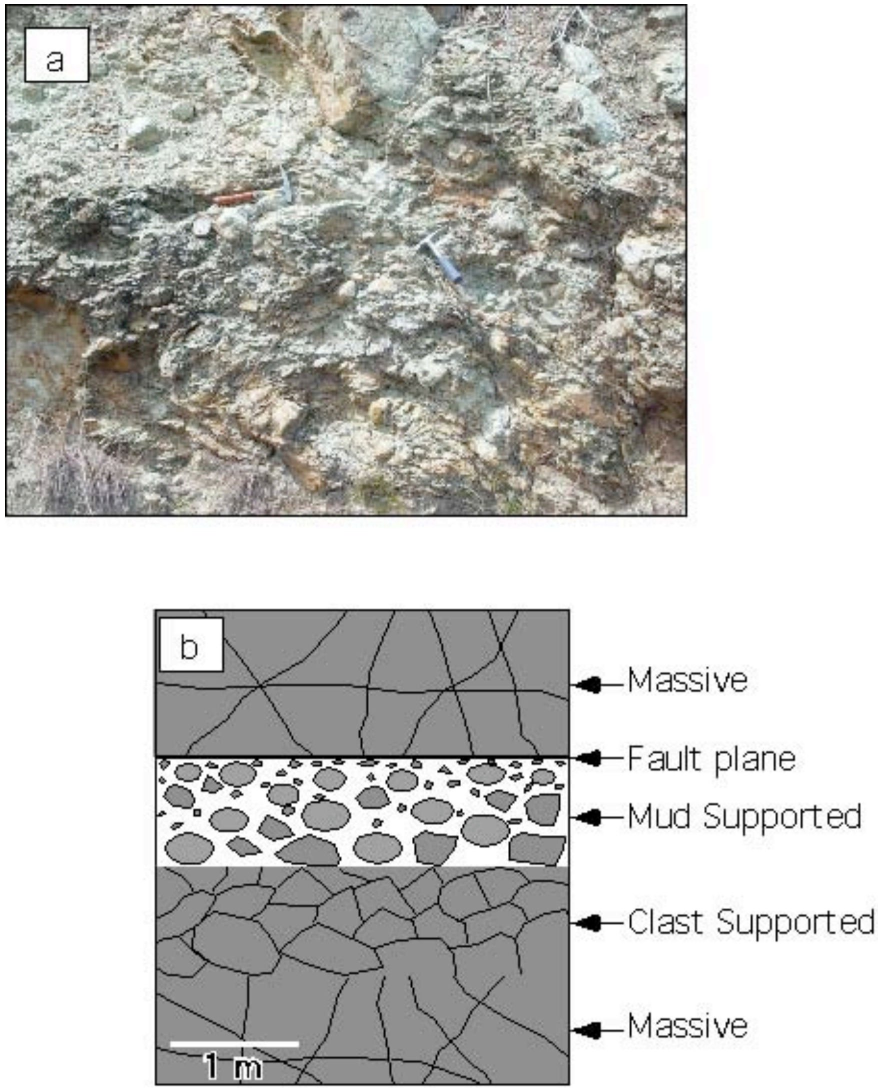


Figure 4.11: a. Mud-supported breccia close to low-angle faults in southeastern Monte del Estado. b. Sketch of serpentinite texture close to thrust at Susúa Forest.

contains foliation that strikes NW-SE and dips moderately to the NE. A matrix-supported conglomerate of serpentinite separates schistose serpentinite from the basalt of the Río Loco Formation. The conglomerate is massive, about 6 m thick, and contains clasts that range in size from less than 1 mm to about 5 cm. There is no visible foliation in the matrix, except where it is deformed by shearing close to the contact with schistose serpentinite. Low-angle, top-to-north shear zones cut the conglomerate. The fault contact is discrete, sub-vertical, and strike varies from NNE to NW. Pyroxene phenocrysts are visible in the basalt, which is silicified and contains quartz veins at contact.

4.3.2.3 Southeast domain

Rounded cobbles to boulders of massive serpentinite within foliated serpentinite matrix characterize the southeast domain of the Monte del Estado mass (along Susúa road on Figure 4.6; Figures 4.10 and 4.11a). Irregular sub-horizontal sheets of subrounded to angular cobbles to boulders of serpentinite within mud-supported serpentinite occur under or between masses of jointed massive serpentinite (Figure 4.11b). Many S-C structures show movement parallel to these sheets. The broken up serpentinite is interpreted as fault breccia over where the massive serpentinite slid along thrust faults. Serpentinite foliations have shallow dip and strike towards the NW (Figure 4.10).

The southern contact is well exposed near Road 368 in Barrio Torre of Sabana Grande where serpentinite overlies the Sabana Grande Formation above a shallowly dipping contact (Figures 4.12a-4.12c). Slodowski (1959) interpreted the contact as a thrust fault and named it the Torre Fault. Structure data gathered for this study supports the interpretation of a southwest-directed thrust fault. The Sabana Grande Formation at the fault contact consists of medium bedded to massive, disrupted mudstone, massive unsorted pyroxene bearing volcaniclastic

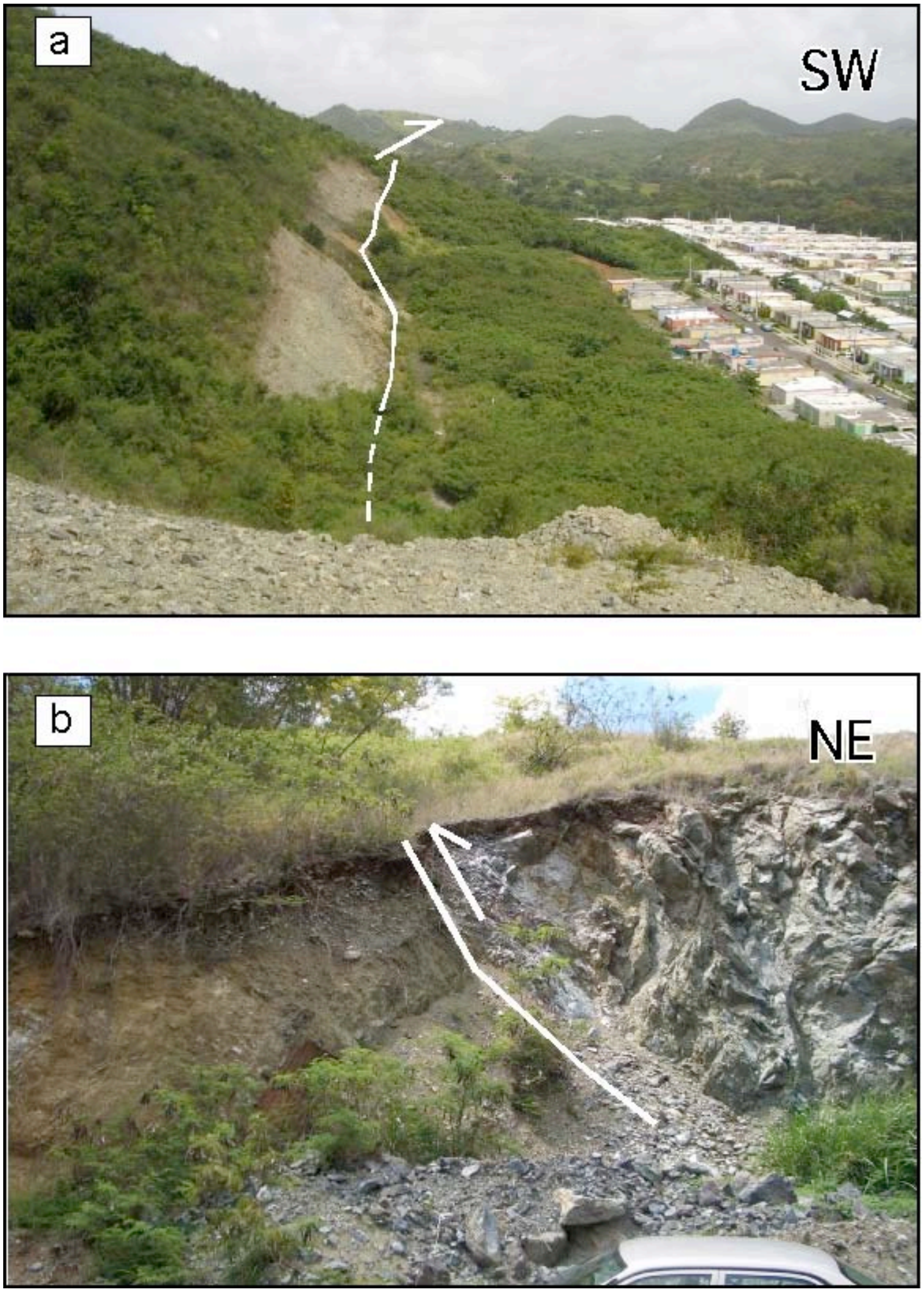


Figure 4.12: Photos of thrust fault contacts of serpentinite over Sabana Grande Formation in southeastern Monte del Estado (a-c, 4-6 on Figure 4.6). d. Thrust fault contact with the Sabana Grande Formation at the southern margin of Río Guanajibo (7 on Figure 4.6).

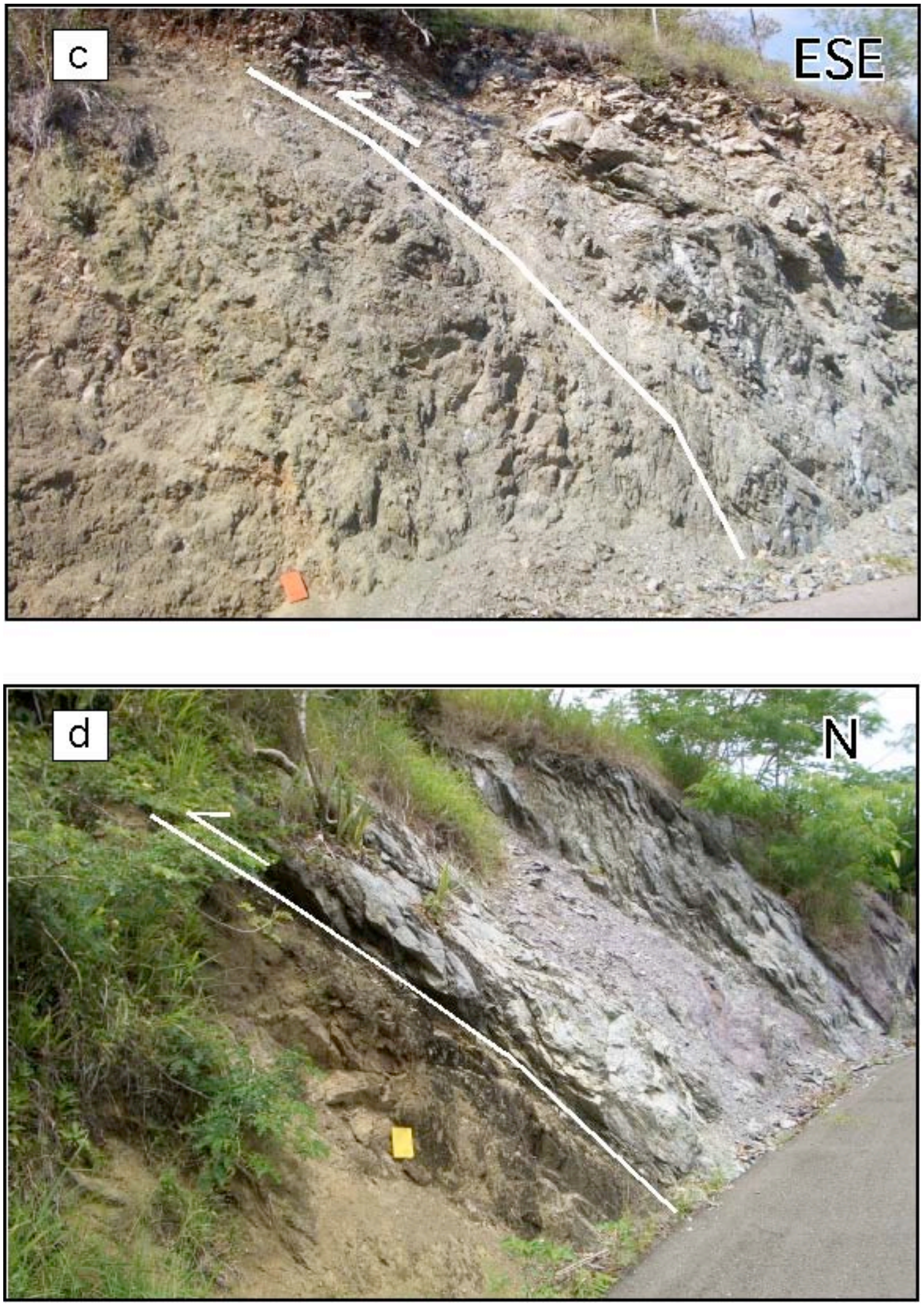


Figure 4.12 (continued)

sandstone, and breccia cut by quartz veins. Clasts within breccia are not sorted and can be up to boulder in size. At the fault contact, rounded to angular massive serpentinite boulders (2.5 m long) occur within the sheared and foliated serpentinite matrix. Sandstone clasts (possibly from the Sabana Grande Formation) also occur within the serpentinite matrix. These clasts range from 1-10 cm and vary from clast supported to matrix supported. The strike of the fault contact varies from NW to SSW, and its dip varies from 45° to 66° towards the SE-NE. Chert beds 1-1.5 m thick and oriented 318°, 48° NE occur within the serpentinite near the fault contact. To the west, contact relations suggest shallow intrusion of the basalt of the Río Loco Formation within the serpentinite.

At the eastern margin near Road 371, the serpentinite is faulted against the Yauco Formation and Río Loco formations (8 and 9 respectively on Figure 4.6). At the northernmost location the contact between Yauco Formation and serpentinite is a dark-red soil. However, mudstone blocks of Yauco Formation in a calcareous matrix are found close to the contact. To the south, angular serpentinite boulders up to 0.8 m long occur in a breccia close to the fault contact that strikes N15°W and dips sub-vertical. To the southeast, breccia is about 20 cm thick, mud supported, made mostly of serpentinite, and occurs at the fault contact with the Río Loco Formation.

At the northern contact between serpentinite and the overlying Maricao Formation, subangular to subrounded clasts of serpentinite and basaltic dolerite with pyrite phenocrysts occur in a conglomerate where clasts from 3 cm to 15 cm are supported by matrix. Most (80%) clasts consist of basalt, and others (20%) consist of serpentinite. The conglomerate is massive and unfoliated. Serpentinite near the contact is brecciated and foliated with abundant matrix of fine-grained serpentinite. The contact is interpreted to be originally depositional.

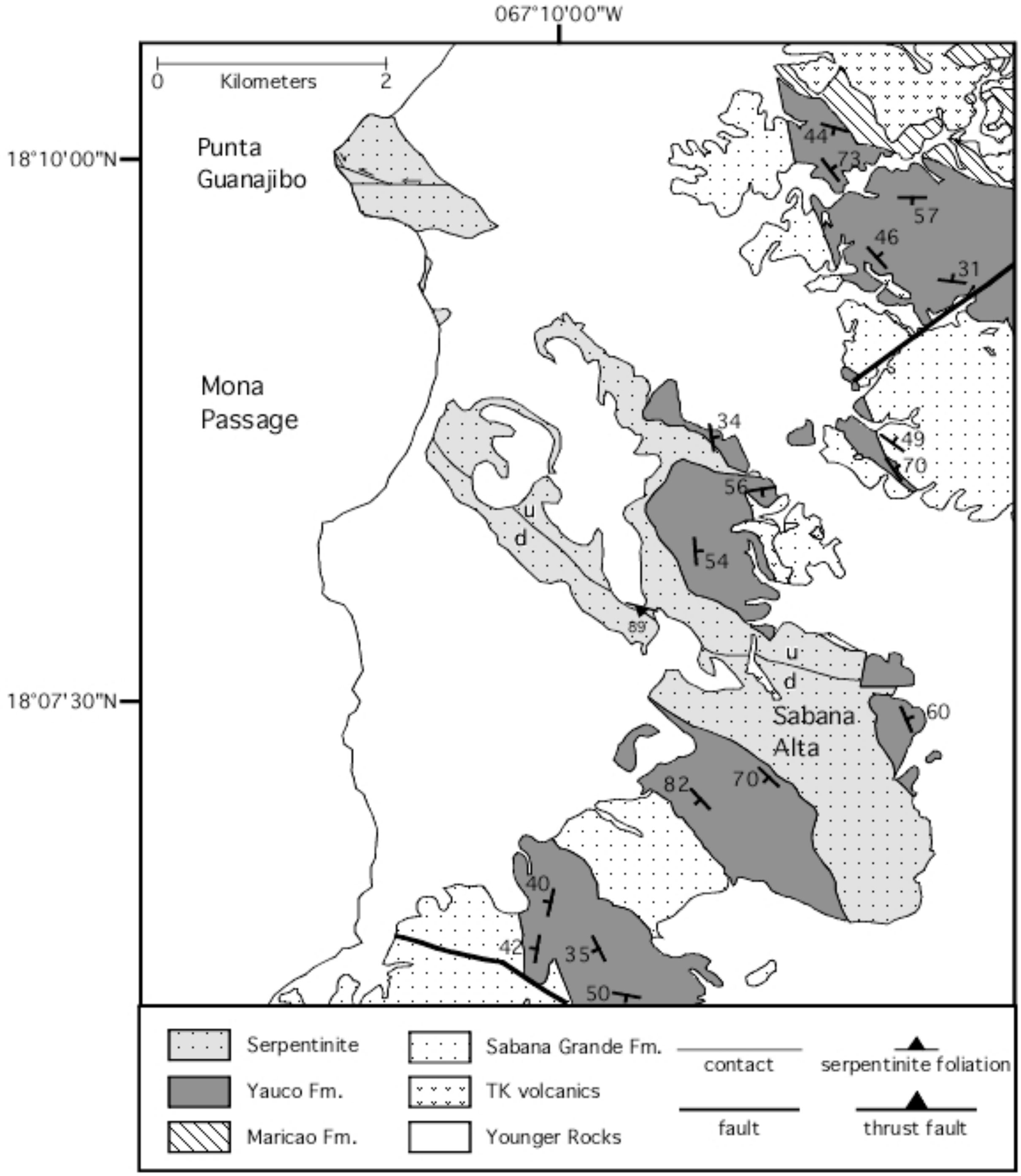


Figure 4.13: Geologic map of Punta Guanajibo, Río Guanajibo serpentinite (modified from Volckmann, 1984b, Curet, 1986).

4.3.3 Río Guanajibo

Serpentinite within the Río Guanajibo belt shows similar textures to serpentinite of Monte del Estado, however it is more serpentinized. The belt is divided geographically into Punta Guanajibo and San Germán domains (Figure 4.3).

4.3.3.1 Punta Guanajibo

Río Guanajibo serpentinite is well exposed along the western coast at Punta Guanajibo, along Road 100 (Figure 4.6), and housing construction sites (Figure 4.13). Sub-vertical right-lateral fault zones are up to 1 m thick and cut massive serpentinite. Left-lateral faults strike E-W and thrust faults strike NW. The fault zones contain massive blocks within foliated matrix. At Sabana Alta, close to Road 100, the Yauco Formation overlays the serpentinite to the NE and SW. Here the Yauco Formation is non-calcareous, tuffaceous laminated mudstone and fine sandstone. These contacts are not well exposed.

4.3.3.2 San Germán

Serpentinite near San Germán occurs within the Guanajibo Valley and is well exposed near Road 2 (Figure 4.6 and 4.14). Pieces of mudstone and volcanic rocks form inclusions within the serpentinite especially near fault contacts (Figure 4.15c). Mafic feldspathic dikes, and quartz-hornblende granodioritic rock intruded the serpentinite. Serpentinite foliations strike NW (Figure 4.14).

At the north contact of the Río Guanajibo in San Germán, the serpentinite is fine-grained and underlies the Sabana Grande and Yauco formations. The contact is an irregular normal fault,

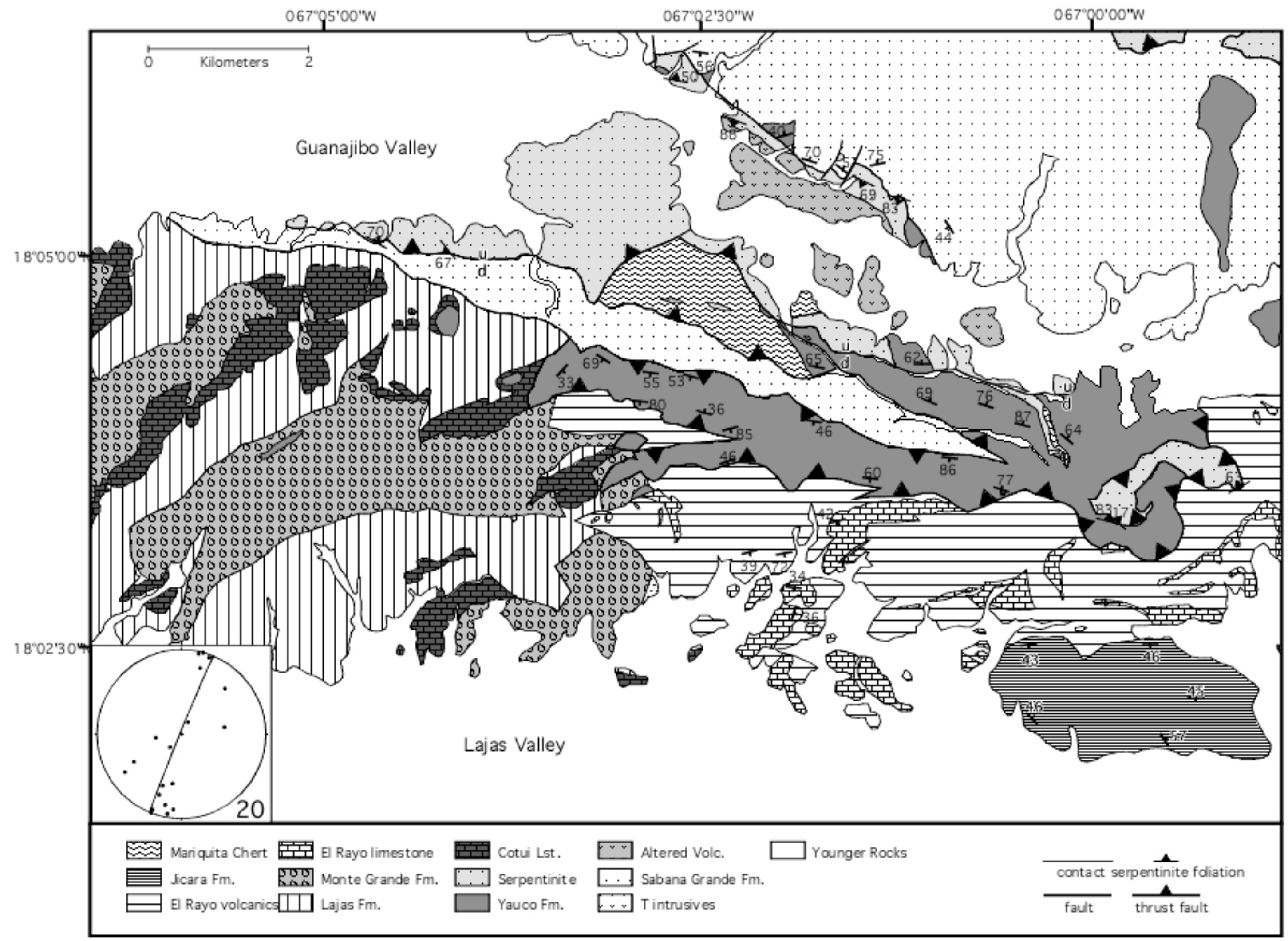


Figure 4.14: Geologic map of central Río Guanajibo serpentinite area (modified from Volckmann, 1984c; Llerandi-Román, 2004). Inset shows poles to serpentine foliations. Great circle is cylindrical best fit.

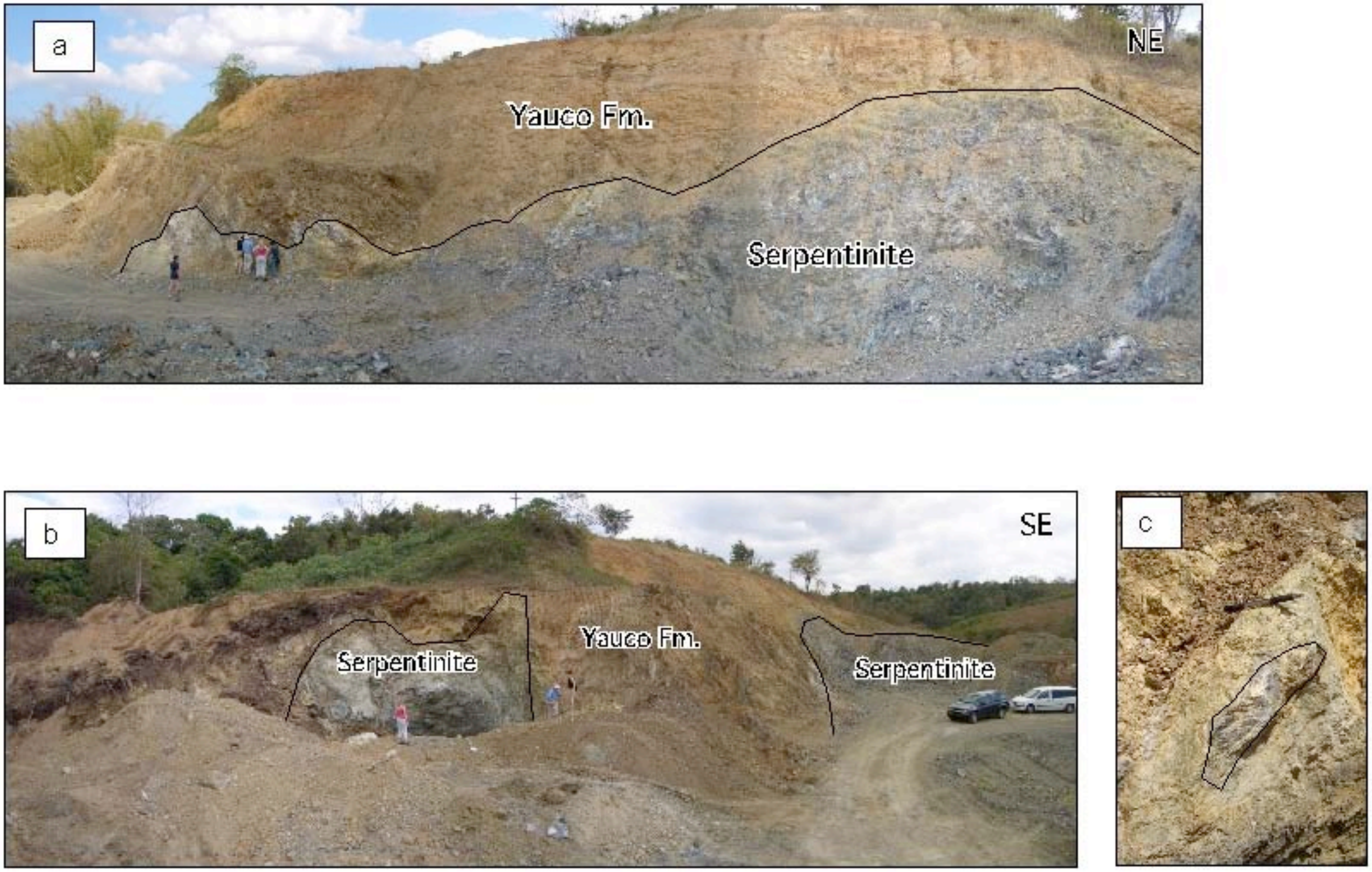


Figure 4.15: Exposed northern contact of the RG serpentinite and Yauco Formation. Black line is the contact. Serpentinite is below and mudstone of the Yauco Formation is above. a. Western view of the contact. b. Northern view of the contact. c. Piece of mudstone from the Yauco Formation within the serpentinite.

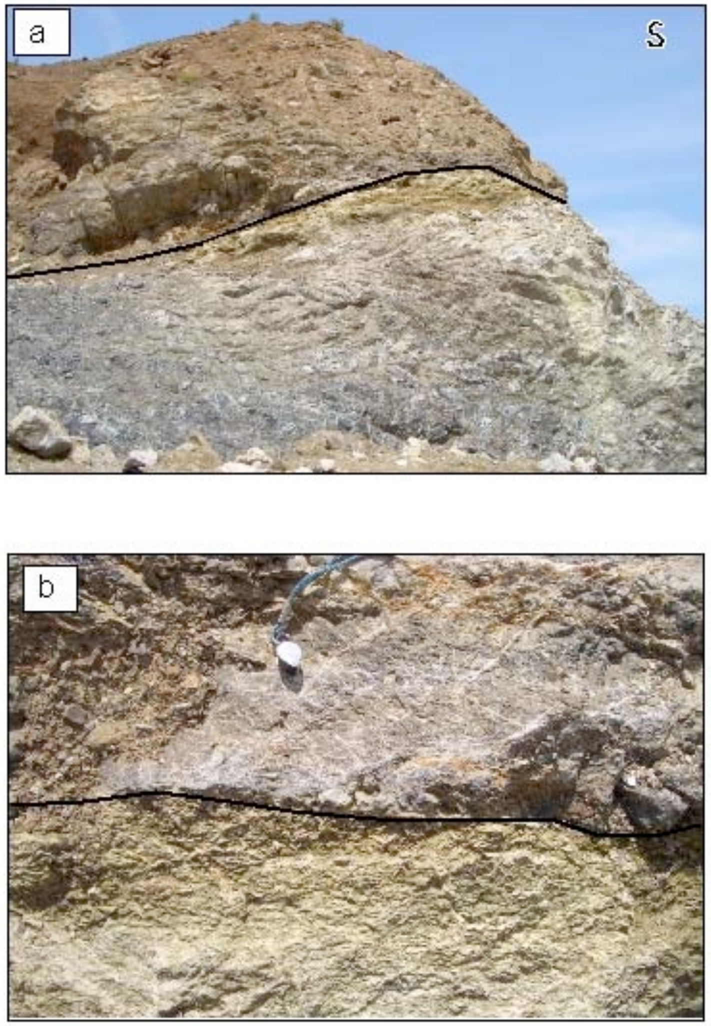


Figure 4.16: Northern contact of the Río Guanajibo serpentinite and Sabana Grande Formation exposed in a quarry north of Road 2. a. Serpentinite underneath contact (black line) and sandstone and conglomerate of the Sabana Grande Formation above the contact. b. Close up of the discrete fault contact between serpentinite and sandstone. White veins at the contact are composed of calcite.

Figure 4.17: Northern fault contact of the Río Guanajibo serpentinite towards the south and Yauco Formation towards the north under Road 2.

in which the hanging wall has moved to the north (Figures 4.15 - 4.17). The dip angle of the fault surface varies from 30° to 70° mostly towards the NE, and the elevation of the contact varies in different locations. The serpentinite is faulted against massive to layered broken non-calcareous tuffaceous mudstone, which forms part of a sedimentary succession of interbedded mudstone, fine sandstone, conglomerate, and breccia of the Yauco and Sabana Grande formations. The mudstone of the Yauco Formation, is laminated in places, contains vesicles and pumice fragments. It is deformed by normal and reverse faults, and slumps that created folds. Mudstone is less tuffaceous upward in the section. Clasts in conglomerate beds are well rounded with low to high sphericity and include aphanitic green to grey volcanic rock, feldspar porphyry, mudstone, serpentinite, and oysters. The conglomerate is matrix supported, poorly sorted, and silicified in places. The interbedded sandstone is fine grained with bedding ranging from laminated to 6 cm thick, and in places is faulted against the serpentinite. Quartz and calcite veins cut the sandstone and serpentinite. A massive brownish feldspar and pyroxene volcanic rock with pieces of purple sandy serpentinite conglomerate also occurs near the contact.

At the southern margin of Río Guanajibo in San Germán, the serpentinite overlies the Sabana Grande Formation along the San Germán Fault (Volckmann, 1984c). The contact is a reverse fault oriented 250°, 35° NW with movement toward the southwest (Figure 4.12d). The serpentinite is highly sheared and contains S-C structures that show thrust and left-lateral sense of movement. The massive mudstone and sandstone of the Sabana Grande Formation are not as deformed as the serpentinite, though they are foliated close to the contact. The smaller serpentinite outcrops to the east also have a fault contact. However, at those locations the serpentinite is thrust over the Sabana Grande, Yauco, and El Rayo formations (Figure 4.14). The reverse fault contact dips from steep to moderate towards the northeast. Sense of shear is top to the southwest.

In this area, the Yauco Formation is thrust upon the El Rayo Formation. Undeformed quartz-diorite dikes intrude the thrust faults between the serpentinite, Yauco, and El Rayo formations (Volckmann, 1984c; Llerandi-Román, 2004). Quartz veins cut serpentinite at the eastern part of the outcrop. Quartz diorite dikes cut the serpentinite at contacts with Yauco Formation probably at 38.4 Ma (Cavosie et al., pers. comm.). Serpentinite is also thrust on the Yauco Formation with a fault contact oriented 304°, 54° NE (Figure 4.14). Disrupted blocks of fine-grained mudstone occur at the fault contact. The serpentinite is cut by quartz veins (2 cm thick) and may be altered by nearby intrusions of feldspar-pyroxene porphyritic dike occurring at the fault contact. Schistose serpentinite contains feldspathic volcanic sandstone blocks containing quartz veins and mudstone. Next to the GuanajiboValley a body of serpentinite crops out and shows signs of contact metamorphism with the feldspar-pyroxene dikes. Many intermediate dikes intrude the serpentinite and calcite and quartz veins cut the serpentinite indicating that hydrothermal processes occurred.

4.3.4 Summary

Field relations between the serpentinite and Late Cretaceous rocks indicate that most exposed contacts are faults. Cerro Las Mesas serpentinite has reverse fault contacts with Yauco, Maricao, and Río Loco formations. The Cordillera Fault is not exposed, but 10 km offset suggests left-lateral movement (McIntyre, 1975). A steep fault contact is also shown in the SW margin of the Center domain of Monte del Estado belt. The NE margin of Monte del Estado is also fault controlled, but it may be a stratigraphic contact to the east. The southern contact of the

Southwest domain of the Monte del Estado belt suggests emplacement above volcaniclastic breccias and sandstones of the Sabana Grande Formation along gently dipping thrust faults as proposed by Slodowski (1956) and Martínez-Colón (2003). Here serpentinite has clasts and boulders made up of sandstone and conglomerate of the Sabana Grande Formation.

East-west striking faults to the south of the Guanajibo Valley in the San Germán Quadrangle (Volckmann, 1984c) and the Sabana Grande Quadrangle (Llerandi-Román, 2004) are interpreted as thrust faults (Figure 4.14). Although Volckmann (1984c) mapped these faults as vertical, fault dips were observed to vary from ~35°-50° towards the northeast. Also the outcrop shape of the Yauco and Sabana Grande formations is of a sheet. Thus, the Yauco and Sabana Grande formations were thrust over the tilted El Rayo Formation, and the Río Guanajibo serpentinite was thrust over Yauco, Sabana Grande, and El Rayo formations. The thrust contact between the Río Guanajibo serpentinite and the Sabana Grande Formation is exposed close to Road 318 in San Germán (Figure 4.12d). There is a fault contact showing top to south sense at the southern margin of the Río Guanajibo serpentinite. A normal fault characterizes the contact to the north in the San Germán area. In the Punta Guanajibo area, contacts are believed to be steeper and fault controlled. Cross-sections of the serpentinite belts show the overall structure of the region in Figure 4.18.

4.4 DISCUSSION

4.4.1 Serpentinite Diapirism

The hypothesis of serpentinite diapirism in southwestern Puerto Rico is based on steeply dipping pyroxene foliations and the circular pattern of poles to bastite foliation on a stereonet (Mattson, 1964; Schwartz, 1970; Mattson and Schwartz, 1971), vertical serpentinite contacts, and inclusions within the serpentinite (Mattson, 1960). However, pyroxene deforms plastically at temperatures higher (>800°C; Ross et al., 1980; Nicolas, 1989) than the upper temperature boundary of serpentinization (550°C; O'Hanley, 1996). Thus, pyroxene foliations and lineation must have formed while the rock was still peridotite in the mantle and before serpentinization. Moreover, bastite foliation measurements in the Monte del Estado and Río Guanajibo belts mostly strike N-S and dip to the east (Figure 4.5c), different than the circular pattern plotted by Mattson and Schwartz (1971) from measurements from Punta Guanajibo. Furthermore, there are low angle serpentinite contacts, and sub-vertical contacts may have rotated from a previously shallower dip. Ductility of the serpentinite at thrust contacts may have incorporated blocks from more resistant Late Cretaceous rocks.

Diapirism in salt is initiated when differential loading overcomes the strength of the overburden and the boundary friction within the salt (Hudec and Jackson, 2007). In order for the diapir to be emplaced the overburden must be removed or displaced either by extension, uplift, erosion, or overthrusting of the salt (Hudec and Jackson, 2007). Additionally, a density contrast between the salt and overlying rock is important. Diapirism involving other rock lithologies must also require these rheological constraints.

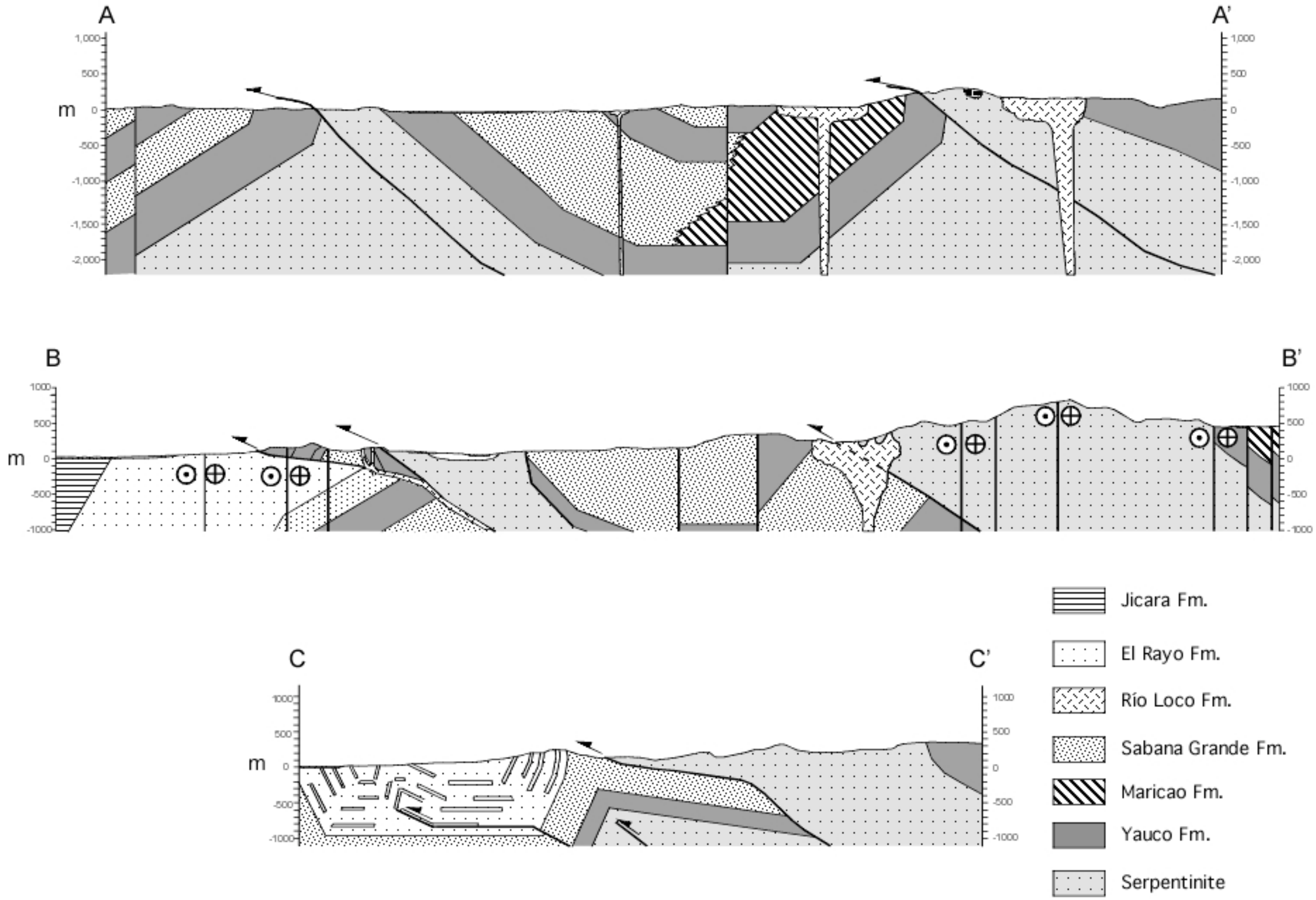


Figure 4.18: Unbalanced cross-sections for transects shown on Figure 4.3.

Diapirism of serpentinite has been documented in the forearc of the Marianas Trench (Fryer et al., 1985). The serpentinite in the forearc of the Marianas Trench is characterized by being a weak water-saturated mud that has densities of 1.7 to 1.8 g/cm^3, compared with 2.5 to 3.0 g/cm^3 of the oceanic crust (Phipps and Ballotti, 1992). There, extension in the forearc may create differential loading that overcomes the low boundary friction of the serpentinite and displaces the overburden. Serpentinite such as that found in Puerto Rico tends to be massive and can be as strong as granite at temperatures lower then 300° C and confining pressures lower than 150 MPa (Raleigh and Paterson, 1965). However, at temperatures of 300-550° C dehydration occurs and the serpentinite becomes significantly weaker (Raleigh and Paterson, 1965).

The Río Guanajibo serpentinite has ultimate strength between 300-670 MPa at surface temperatures and confining pressure of 75 MPa (Handin, 1964). The density of Río Guanajibo serpentinite ranges from 2.03-2.75 g/cm^3 and averages at 2.55 g/cm^3, whereas average density for Late Cretaceous rocks is 2.70 g/cm^3 (Bromery and Griscom, 1964). This 0.15 g/cm^3 density contrast is too low to create a diapir. Although density contrasts as low as 0.1 g/cm^3 have yielded salt diapirs (Phipps and Ballotti, 1992), the abundant massive texture of the Monte del Estado and Río Guanajibo serpentinites may be too strong to permit any upward rise due to buoyancy differences with the Late Cretaceous rocks. If there is any diapirism related with these serpentinites, it must be locally where fine-grained weak serpentinite mud formed at fault zones moves upward for probably a short distance, and not as a regionally primary driving force as has been previously described.

4.4.2 Thrust Fault Emplacement

Fault contacts and S-C fabric from shear zone data record contractional deformation in the serpentinite, which was accommodated by thrust faults. Although, there are thrust contacts that indicate a top to NE sense (Figure 4.8d) these are considered backthrusts because most thrust fault contacts slid towards the southwest (present coordinates). Folds and foliations defined by aligned serpentine indicate NE-SW-directed maximum shortening strain (Figures 4.5, 4.5b, 4.8 - 4.10, 4.14). These structures do not support earlier conclusions that serpentinite moved upward as diapirs. Instead they suggest that they formed as a result of tectonic stress. It is suggested that foreland propagation of thrust faults led to development of fault-propagation folds. Late Cretaceous rocks were also involved in the deformation as thrust sheets of Yauco and Sabana Grande formations moved southward over El Rayo Formation. The thrust relationship of serpentinite over steeply dipping Maastrichtian-Paleocene rocks of El Rayo Formation indicates that thrusting of serpentinite occurred after deposition and deformation of El Rayo Formation.

NW-striking thrust fault deformation is associated with ESE-striking left-lateral faults in the serpentinite. Moreover, there are many oblique shear planes that indicate top-to-the-SW movement. These structures may be related to late Eocene-early Oligocene transpression recorded in the Cerrillos belt as suggested by their strain compatibility (Glover, 1971; Erikson et al., 1990; Laó-Dávila, 2002). If this is the case, the age for thrust faulting and emplacement of serpentinite can be constrained to Paleocene to early Oligocene. This would represent a younger and separate event than the Early Cretaceous collision suggested by Mattson (1973) in which ultramafic rocks from Sierra Bermeja were thrust northward based on vergence of folded chert.

On a regional scale, transpression affected rocks from the Cerrillos belt to thrust faults south of the Río Guanajibo serpentinite. The deformation may have been accommodated by structural domains, which were deformed by NNE maximum shortening direction (e.g. Río Culebrinas Formation, Yauco Formation, Monte del Estado) and are separated by E-W and NW-SE striking left-lateral faults (e.g. Cerro Goden and Cordillera faults; Figure 4.19).

4.4.3 Tectonic History

The tectonic history of southwestern Puerto Rico is explained based on structural relationships in the serpentinite and previous studies (Figure 4.20). Serpentinite formed from Early Jurassic-Early Cretaceous abyssal peridotite in a mid-oceanic ridge (Lewis et al., 2006b). Accretion along a northward-directed subduction zone coalesced fragments of serpentinite, amphibolite, metabasalt, gneiss, schist, and chert to form a serpentinite mélange (Mattson, 1973; Schellekens, 1998). An Early Cretaceous collision uplifted the serpentinite mélange and thrust it to the north (present coordinates; Mattson, 1973). Late Cretaceous volcanic and sedimentary strata were deposited on top of exposed debris flows derived from the serpentinite mélange (Mattson, 1979; Curet, 1981). In Paleocene to early Oligocene the lithosphere was shortened and laterally sheared during early Tertiary transpression in western Puerto Rico. In Puerto Rico serpentinite in the Monte del Estado and Río Guanajibo was thrust to the southwest (present coordinates) concurrent with folding in overlying rocks. The movement created large-scale left-lateral faults, some of which broke through the boundary between serpentinite and volcanic and sedimentary rocks. Bends in the strike of these faults may have created contraction and uplifted even more the serpentinite. By mid-Oligocene, contraction terminated throughout the island and N-S extension affected rocks throughout the Pliocene.

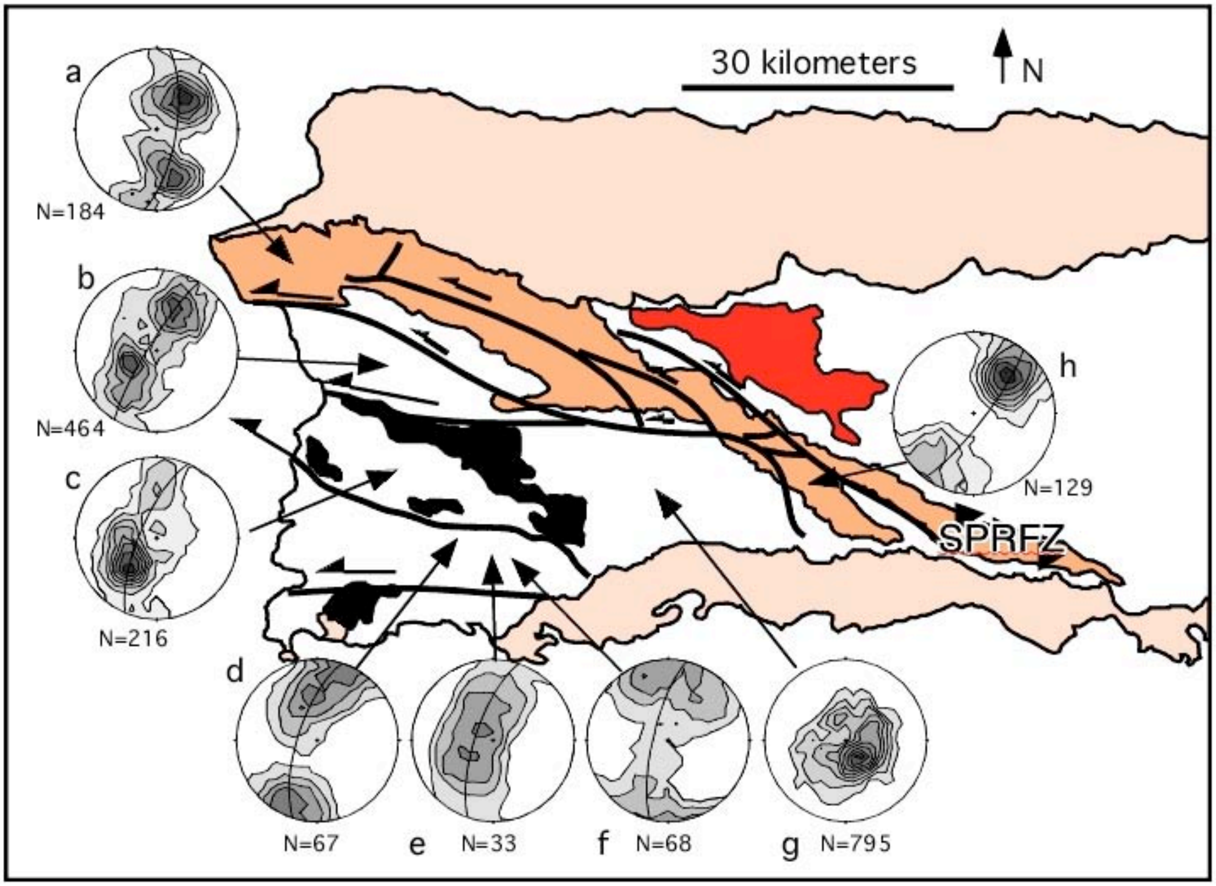


Figure 4.19: Poles to bedding for sedimentary formations in western Puerto Rico indicating folds in between left-lateral faults. a. Río Culebrinas Fm., b. Yauco Fm north of Cordillera Fault, c. Yauco Fm. north of Guanajibo Valley, d. Yauco Fm. south of Río Guanajibo serpentinite, e. Jicara Fm., f. El Rayo Fm., g. Yauco Fm. east of Monte del Estado serpentinite, h. Monserrate Fm. (data from Mattson, 1968a, 1968b; McIntyre, 1971, 1975; Krushensky and Monroe, 1975, 1978, 1979; Monroe, 1980; Volckmann, 1984a, 1984b, 1984c; Curet, 1986; Laó-Dávila, 2002; Martínez Colón, 2003; Llerandi Román, 2004). Same legend as in Figure 1.6.

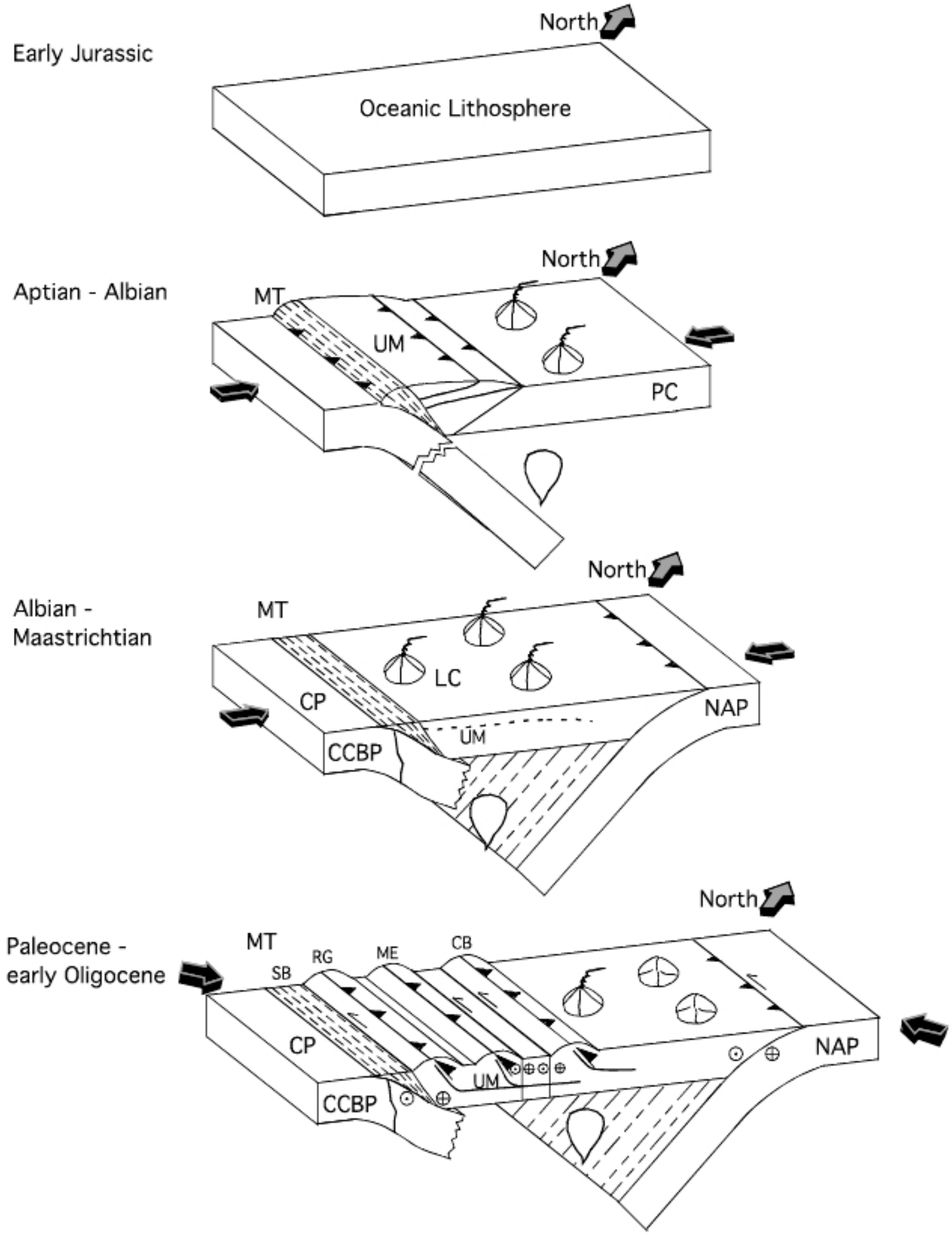


Figure 4.20: Late Jurassic to early Oligocene tectonic history of southwestern Puerto Rico. PC = Proto Caribbean, CCBP = Cretaceous Caribbean basalt province, NAP = North American plate, CP = Caribbean plate, SB = Sierra Bermeja, RG = Río Guanajibo, ME = Monte del Estado, CB = Cerrillos belt, UM = ultramafic mélange, LC = Late Cretaceous rocks, MT= Muertos Trough. Dashed zone is a forearc.

4.5 CONCLUSIONS

The study of serpentinite mesostructures and contacts with Late Cretaceous rocks reveals that deformation of serpentinite in Monte del Estado and Río Guanajibo is characterized by thrust and left-lateral shear zones and faults, NW striking serpentine foliation, and folded foliations. Most contacts with Late Cretaceous rocks are faults. This data suggests a new interpretation for the relation of serpentinite to sedimentary rocks in southwestern Puerto Rico. After emplacement of serpentinite in Early Cretaceous, the serpentinite was thrust southward in Paleocene-early Oligocene and was cut by left-lateral faults. Stress caused thrusting of the serpentinite and folded the overlying Late Cretaceous-Early Tertiary rocks. This deformation event is different to the previous reported events suggested for Sierra Bermeja and Duarte Complex in Hispaniola where the Early Cretaceous northward thrusting is postulated by Mattson (1973), and Draper and et al. (1996). However, it is temporally similar to the younger Paleocene-early Oligocene emplacement events that occurred in Guatemala, Cuba, Jamaica, and Hispaniola (Lewis et al., 2006a).

5.0 CONCLUDING REMARKS

5.1 CONCLUSIONS

In southwest Puerto Rico studies at the meso-, micro-, and macro-scale reveal new information of the tectonic evolution of southwest Puerto Rico:

1. The study of microstructures and textures in Monte del Estado and Río Guanajibo serpentinite bodies improve our understanding of its deformational processes. High temperature deformation in peridotite is suggested by granuloblastic olivine and foliation and lineation in porphyroclastic pyroxene. Replacement of serpentine textures and minerals is common throughout the serpentinite bodies. Serpentine mylonites are described for the first time in southwest Puerto Rico and indicate strong deformation at temperatures of 400-600°C and pressures greater than 400 MPa. Brittle deformation overprints ductilely deformed serpentinite. Breccia composed of serpentinite was probably deposited as debris flows on top of the massive serpentinite (Curet, 1981). Deformation conditions may not be related to the proposed diapirism (Mattson, 1960; Schwartz, 1970; Jolly et al., 1998b). Instead the deformation might be caused in response to tectonic stresses at the Caribbean-North American plate boundary zone.

2. Shear zones and brittle faults show that the Monte del Estado and Río Guanajibo serpentinite masses in southwestern Puerto Rico were mainly deformed by 1) NW-striking right-lateral faults and E-striking thrust faults, 2) NW-SE striking thrust faults and E-W striking left-

lateral shear zones, and 3) a younger group comprising N-directed thrust faults and NW-directed left-lateral faults. The N-directed shortening of the first group may be older and subsequent stress reactivated its shear planes and the shear planes from the second group suggest deformation within a transpressional regime. During development of this event the principal shortening direction was southwestward and may have later rotated to a westerly direction. Involvement of Eocene rocks indicates that the contractional and related strike-slip faults are late Eocene. Serpentinite was later affected during Neogene N-S extension that is recorded throughout western Puerto Rico. Evidence for diapirism is not evident in these structures. Serpentinite deformation in southwestern Puerto Rico differs from deformation of other serpentinite masses in the northern Caribbean. Part of Cuban serpentinites, Loma Caribe serpentinite in central Hispaniola, and Sierra Bermeja serpentinite were thrust northward in Early Tertiary. However, Monte del Estado and Río Guanajibo serpentinites in southwestern Puerto Rico show thrust faults that mostly dip NNE and thrust towards the SSW during the Early Cenozoic.

3. Mesostructures and contacts with Late Cretaceous rocks reveals that deformation of serpentinite in Monte del Estado and Río Guanajibo is characterized by thrust and left-lateral shear zones and faults, NW-striking serpentine foliation, and folded foliations. Most contacts with Late Cretaceous rocks are faults. This data suggests a new interpretation for the relation of serpentinite to sedimentary rocks in southwestern Puerto Rico. After emplacement of serpentinite in Early Cretaceous, the serpentinite was thrust southward in Paleocene-early Oligocene and was cut by left-lateral faults. Stress caused thrusting of the serpentinite and folded the overlying Late Cretaceous-Early Tertiary rocks. This deformation event is different to the previous reported events suggested for Sierra Bermeja and Duarte Complex in Hispaniola

where the Early Cretaceous northward thrusting is postulated by Mattson (1973), and Draper et al. (1996). However, it is temporally similar to the younger Paleocene-early Oligocene emplacement events that occurred in Guatemala, Cuba, Jamaica, and Hispaniola (Lewis et al., 2006a).

This study shows that the study of serpentinite structure at different scales can improve our understanding of serpentinite emplacement and deformation. The techniques used in this study can be applied to other serpentinite bodies in different tectonic settings. Moreover, serpentinite bodies that may have been previously interpreted as serpentinite diapirs may have been emplaced as thrust sheets. A change of interpretation for serpentinite emplacement has implications for the tectonic setting of particular regions and should be considered when building tectonic models.

5.2 FUTURE STUDIES

Future studies of serpentinite in southwest Puerto Rico should include various geophysical techniques (gravity, magnetic, seismic, etc) as the bulk of such studies was done 48 years ago (Burk, 1964) and improved technologies should considerably improve our understanding of the structure of serpentinite at depth. This has practical applications to the region of southwest Puerto Rico because many microseismic events seem to concentrate where the serpentinite is located (Huérfano et al., 2005). Moreover, future studies should investigate in more detail the serpentine minerals within the three belts using X-ray and stable isotopes as they can give more information about environmental conditions and serpentinization processes. Additionally, a search should be conducted to find unserpentinized peridotite to conduct petrological and geochemical studies to better understand its source and history prior to serpentinization. And lastly, similar studies of the kinematics of shear zones in serpentinite should be conducted in Hispaniola and Cuba to constrain even more the deformations at the Caribbean-North American plate boundary zone, and in other relict subduction zones where these type of study can help to unravel its tectonic evolution.

APPENDIX A

STRUCTURAL DATA

All structure data used for this dissertation is presented in the tables below grouped by field seasons (2006, summer 2005, and Spring Break (SB) 2005). Abbreviations are listed below:

B. = serpentinite body	N = Normal fault
C = C-plane	R = Reverse fault
D = Dike	RL = Right-lateral fault
F = fault	S = S-plane
FS = foliation in serpentinite	SH = Shear zone
G = Río Guanajibo	slip dir. = slip direction
GPS = coordinates obtained using Global Positioning System	Stri. = striation
	SS = sandstone
LL = Left-lateral fault	T = Thrust fault
ME = Monte del Estado	

A.1 SHEAR ZONE DATA

Shear zone data 2006									
#	B.	Location	C	S	Sense	slip dir.	Stri.	Comments	GPS
1	ME	Rd 119 01SP06	297, 76 NE	241, 27 N	N	62, 090			18°9'1"N; 67°2'11"W
2	ME	Rd 119 01SP06	276, 81 NE		?				18°9'1"N; 67°2'11"W
3	ME	Rd 362 05SP06	308, 32 SW	328, 74 SW	R TOP TO NE	28, 250			18°7'14"N; 66°59'23"W
4	ME	Rd 362 05SP06	302, 37 SW	293, 88 SW	R TOP TO NE	36, 198		1 M THICK	18°7'14"N; 66°59'23"W
5	ME	Rd 362 05SP06	138, 55 SW		R?			BASED ON HIGH S PLANES	18°7'14"N; 66°59'23"W
6	ME	Rd 362 05SP06	342, 50 SW	315, 85 SW	R	35, 198			18°7'14"N; 66°59'23"W
7	ME	Rd 362 06SP06	317, 43 SW	297, 69 SW	R	32, 180			18°7'28"N; 66°59'14"W
8	ME	Rd 362 07SP06	303, 86 SW	337, 78 SW	LL	15, 124			18°7'38"N; 66°59'14"W
9	ME	Rd 362 07SP06	106, 68 NE	117, 86 NE	R-LL TOP TO NW	52, 076			18°7'38"N; 66°59'14"W
10	ME	Rd 362 08SP06	311, 79 NE	299, 54 NE	N TOP TO NE	66, 106			18°7'41"N; 66°59'13"W
11	ME	Rd 362 09SP06	288, 66 SW	196, 62 NW	N	25, 119			18°7'42"N; 66°59'12"W
12	ME	Rd 362 09SP06	295, 44 SW	237, 31 NW	N?	37, 167			18°7'42"N; 66°59'12"W
13	ME	Rd 362 10SP06	181, 72 NW		RL TOP TO E		28, 178		18°7'45"N; 66°59'6"W
14	ME	Rd 362 10SP06	323, 90		?				18°7'45"N; 66°59'6"W
15	ME	Rd 362 10SP06	334, 85 NE	340, 55 NE	N				18°7'45"N; 66°59'6"W
16	ME	Rd 120 11SP06	281, 83 NE	303, 54 SW	R	65, 086	60, 296		18°8'14"N; 66°57'22"W
17	ME	Rd 120 11SP06	228, 60 SE		N??				18°8'14"N; 66°57'22"W
18	ME	Rd 120 12SP06	282, 24 SW	229, 34 NW	N?	20, 155			18°8'18"N; 66°57'26"W
19	ME	Rd 120 14SP06	179, 16 NE	179, 50 NE	T?	16, 089			18°8'39"N; 66°58'00"W
20	ME	Rd 120 15SP06	331, 78 NE		RL		07, 347	CUTS F33	18°8'38"N; 66°58'4"W
21	ME	Rd 120 15SP06	173, 85 SW	351, 68 NE	N	83, 226			18°8'38"N; 66°58'4"W

22	ME	Rd 119 16SP06	267, 56 NW	285, 69 NE	?			18°9'21"N; 67°2'7"W
23	ME	Rd 119 16SP06	272, 54 NE	254, 76 NE	R TOP TO S	38, 306		18°9'21"N; 67°2'7"W
25	ME	Rd 119 18SP06	268, 77 NW	217, 80 NW	RL	02, 088		18°9'42"N; 67°1'56"W
26	ME	Rd 119 18SP06	239, 78 SE	273, 82 NE	R	28, 232		18°9'42"N; 67°1'56"W
27	ME	Rd 119 18SP06	281, 54 SW	289, 90	R	52, 213	20 CM THICK	18°9'42"N; 67°1'56"W
28	ME	Rd 119 18SP06	230, 60 SE	251, 85 NW	R	46, 194	SMALL	18°9'42"N; 67°1'56"W
29	ME	Rd 119 18SP06	262, 52 SE	228, 62 SE	R TOP TO W	07, 088		18°9'42"N; 67°1'56"W
30	ME	Rd 119 18SP06	245, 56 NW		?			18°9'42"N; 67°1'56"W
31	ME	Rd 119 18SP06	283, 65 SW	262, 85 SE	R	37, 123		18°9'42"N; 67°1'56"W
32	ME	Rd 119 18SP06	273, 25 NE	279, 65 NE	T	25, 013	1 M THICK	18°9'42"N; 67°1'56"W
33	ME	Rd 119 22SP06	262, 70 NW	292, 65 NE	R?	15, 268		18°9'10"N; 67°2'23"W
34	ME	Rd 119 22SP06	300, 70 NE		?			18°9'10"N; 67°2'23"W
35	ME	Rd 119 22SP06	287, 50 NE	312, 82 NE	R??	35, 072		18°9'10"N; 67°2'23"W
36	ME	Rd 120 23SP06	317, 76 NE	255, 80 NW	RL	04, 137		18°6'3"N; 66°57'33"W
37	ME	Rd 120 23SP06	289, 17 NE	281, 43 NE	T	16, 006		18°6'3"N; 66°57'33"W
38	ME	Rd 120 23SP06	248, 21 NW	260, 57 NW	T	20, 356		18°6'3"N; 66°57'33"W
39	ME	Rd 120 23SP06	230, 19 NW	219, 45 NW	T	18, 301	CUTS SHZ38	18°6'3"N; 66°57'33"W
40	ME	Rd 120 24SP06	234, 83 NW	262, 70 NW	N??	28, 238		18°6'12"N; 66°57'22"W
41	ME	Rd 120 24SP06	272, 69 NE	246, 72 NW	RL??	02, 273		18°6'12"N; 66°57'22"W
42	ME	Rd 120 25SP06	275, 18 NE	205, 43 SE	N TOP TO N	10, 308		18°6'21"N; 66°57'23"W
43	ME	Rd 120 25SP06	202, 20 SE	260, 52 SE	LL TOP TO N	05, 188		18°6'21"N; 66°57'23"W
44	ME	Rd 120 25SP06	208, 41 SE	267, 70 SE	LL TOP TO N	06, 200		18°6'21"N; 66°57'23"W
45	ME	Rd 120 25SP06	315, 34 NE		TOP TO S??			18°6'21"N; 66°57'23"W
46	ME	Rd 120 26SP06	306, 67 NE	286, 83 NE	RL TOP TO S	33, 322		18°6'25"N; 66°57'23"W
47	ME	Rd 120 26SP06	270, 45 S	270, 63 S	R??	45, 180		18°6'25"N; 66°57'23"W
48	ME	Rd 120 26SP06	297, 87 NE	289, 79 SW	RL	61, 302		18°6'25"N; 66°57'23"W
49	ME	Rd 120 26SP06	270, 79 N	245, 65 SE	RL	55, 286		18°6'25"N; 66°57'23"W
50	ME	Rd 120 27SP06	290, 28 SW	323, 47 SW	R TOP TO NE	13, 264		18°6'29"N; 66°57'25"W
51	ME	Rd 120 27SP06	288, 31 SW	321, 47 SW	R TOP TO E	12, 267		18°6'29"N; 66°57'25"W

52	ME	Rd 120 30SP06	295, 87 SW	340, 83 NE	LL	13, 294		BIG TRACE 10 CM THICK	18°6'37"N; 66°57'23"W
53	ME	Rd 120 31SP06	292, 50 NE	278, 78 NE	R	43, 342			18°6'39"N; 66°57'20"W
54	ME	Rd 120 31SP06	307, 75 NE	308, 69 NE	RL??	72, 006	08, 125		18°6'39"N; 66°57'20"W
55	ME	Rd 120 32SP06	305, 90	327, 65 NE	LL??	51, 305		BIG TRACE 4 M THICK MAP IT	18°6'39"N; 66°57'20"W
56	ME	Rd 120 32SP06	331, 58 SW	329, 77 SW	R	57, 230		SMALL 0.8 M THICK	18°6'39"N; 66°57'20"W
57	ME	Rd 120 33SP06	303, 64 SW	339, 88 SW	LL-R TOP TO SE	25, 289			18°6'43"N; 66°57'17"W
58	ME	Rd 120 33SP06	290, 67 SW	332, 83 SW	R-LL TOP TO SE	14, 284			18°6'43"N; 66°57'17"W
59	ME	Rd 120 33SP06	161, 60 SW	181, 78 NW	LL-R TOP TO SE	34, 319			18°6'43"N; 66°57'17"W
60	ME	Rd 120 33SP06	182, 50 NW	328, 19 SW	N TOP TO W	47, 299	36, 315		18°6'43"N; 66°57'17"W
61	ME	Rd 120 33SP06	162, 28 SW	200, 52 NW	T TOP TO E	12, 317		FAULT BRECCIA	18°6'43"N; 66°57'17"W
62	ME	Rd 120 34SP06	284, 25 SW	304, 50 SW	T TOP TO NE	20, 231			18°6'57"N; 66°57'03"W
63	ME	Rd 120 34SP06	289, 86 SW	300, 63 NE	R TOP TO E	72, 278		CUTS SH62??	18°6'57"N; 66°57'03"W
64	ME	Rd 120 34SP06	307, 57 SW	306, 86 SW	R TOP TO E	57, 213			18°6'57"N; 66°57'03"W
65	ME	Rd 120 34SP06	323, 30 SW	331, 68 SW	R TOP TO E	30, 246			18°6'57"N; 66°57'03"W
66	ME	Rd 120 34SP06	300, 80 SW	335, 80 SW	LL TOP TO SE	03, 121			18°6'57"N; 66°57'03"W
67	ME	Rd 120 34SP06	279, 32 SW	324, 67 SW	LL TOP TO E	14, 255			18°6'57"N; 66°57'03"W
68	ME	Rd 120 34SP06	348, 31 SW	179, 57 SW	TOP TO SE	28, 281			18°6'57"N; 66°57'03"W
69	ME	Rd 120 35SP06	289, 28 SW	331, 77 SW	TOP TO E	17, 253			18°6'58"N; 66°57'00"W
70	ME	Rd 120 35SP06	299, 88 SW	280, 75 SW	TOP TO NW	36, 297		3 M THICK, CUTS SH69?	18°6'58"N; 66°57'00"W
71	ME	Rd 120 37SP06	269, 28 SE	312, 61 SW	R TOP TO E	13, 242		1 M THICK PH FOLIATION	18°7'07"N; 66°57'07"W
72	ME	Rd 120 37SP06	155, 55 NE	308, 87 NE	TOP TO SW	36, 006	13, 146		18°7'07"N; 66°57'07"W
73	ME	Rd 120 39SP06	214, 72 NW	204, 65 SE	R TOP TO SE	68, 268			18°7'49"N; 66°57'27"W
74	ME	Rd 120 39SP06	216, 85 NW	199, 78 SE	RL??	45, 221	28, 216		18°7'49"N; 66°57'27"W

75	ME	Rd 120 40SP06	308, 58 NE	280, 70 NE	RL TOP TO SE	16, 318		SMALL	18°7'43"N; 66°57'22"W
76	ME	Rd 120 42SP06	178, 85 SW	195, 86 NW	LL?? TOP TO S	03, 357			18°7'37"N; 66°57'11"W
77	ME	Rd 120 42SP06	170, 74 NE	198, 83 SE	LL	14, 166			18°7'37"N; 66°57'11"W
78	ME	Rd 120 43SP06	267, 50 SE	320, 18 NE	N TOP TO SW	47, 201			18°7'32"N; 66°57'13"W
80	ME	Rd 120 43SP06	295, 66 SW	304, 50 SW	N?	57, 158	59, 247		18°7'32"N; 66°57'13"W
81	ME	Rd 120 44SP06	259, 70 NW	256, 24 NW	N TOP TO N	70, 355		2.5 M THICK; GOUGE	18°7'20"N; 66°56'59"W
82	ME	Rd 120 45SP06	235, 88 SE	280, 80 SW	LL-R TOP TO N	12, 056	67, 234		18°7'13"N; 66°57'0"W
83	ME	Rd 120 45SP06	290, 66 SW	295, 90	R TOP TO N	63, 228			18°7'13"N; 66°57'0"W
84	ME	Rd 120 45SP06	332, 44 NE	290, 45 NE	R TOP TO SW	09, 143	19, 004		18°7'13"N; 66°57'0"W
85	ME	Rd 120 47SP06	316, 36 SW	280, 58 SW	R?	15, 157			18°7'28"N; 66°57'03"W
86	ME	Rd 120 48SP06	177, 60 SW	160, 80 SW	R TOP TO E	40, 206		3 CM THICK	18°7'27"N; 66°57'09"W
87	ME	Rd 120 49SP06	278, 51 NE	271, 71 NE	R TOP TO S	47, 339			18°7'31"N; 66°57'13"W
88	ME	Rd 120 50SP06	205, 35 SE	229, 64 SE	R?	26, 161			18°8'21"N; 66°57'30"W
89	ME	Rd 120 53SP06	330, 45 SW	308, 86 NE	R	39, 203			18°8'37"N; 66°58'5"W
90	ME	Rd 120 53SP06	293, 38 NE	310, 51 NE	TOP TO SW	24, 079		2 M THICK	18°8'37"N; 66°58'5"W
91	ME	Rd 120 53SP06	286, 66 SW	299, 85 NE	LL	56, 245	25, 110		18°8'37"N; 66°58'5"W
92	ME	Rd 120 54SP06	310, 85 NE	340, 66 NE	LL??	37, 313	40, 314	0.1-0.8 M THICK	18°8'36"N; 66°58'7"W
93	ME	Rd 120 54SP06	268, 28 NW	326, 33 NE	TOP TO W	08, 283			18°8'36"N; 66°58'7"W
94	ME	Rd 120 54SP06	194, 12 NW	321, 40 SW	TOP TO E	05, 217		CUTS FS 59	18°8'36"N; 66°58'7"W
95	ME	Rd 120 55SP06	302, 33 NE	310, 65 NE	LL-N?	32, 047	40, 330	CUTS F109	18°8'34"N; 66°58'9"W
96	ME	Rd 120 55SP06	320, 22 NE	350, 50 NE	T TOP TO W	16, 098			18°8'34"N; 66°58'9"W
97	ME	Rd 120 55SP06	350, 72 SW	340, 82 SW	RL	42, 187		SMALL	18°8'34"N; 66°58'9"W
98	ME	Rd 120 55SP06	336, 74 SW	322, 82 SW	RL	28, 164			18°8'34"N; 66°58'9"W
99	ME	Rd 120 55SP06	258, 35 SE	255, 15 NW	N TOP TO SE	35, 166	39, 130	CUTS SH98	18°8'34"N; 66°58'9"W
100	ME	Rd 120 55SP06	022, 15 NW	330, 33 NE	TOP TO SW	12, 253			18°8'34"N; 66°58'9"W
101	ME	Rd 120 56SP06	324, 40 NE	287, 58 NE	?				18°8'30"N; 66°58'12"W

102	ME	Rd 120 56SP06	328, 66 NE	PARALLEL	?			LARGE	18°8'30"N; 66°58'12"W
103	ME	Rd 120 56SP06	270, 22 N	295, 61 NE	T TOP TO SW	18, 036			18°8'30"N; 66°58'12"W
104	ME	Rd 120 56SP06	275, 40 NE	294, 44 NE	T TOP TO SW	06, 087			18°8'30"N; 66°58'12"W
105	ME	Rd 120 57SP06	314, 38 SW	349, 70 SW	R? TOP TO NE	22, 284			18°8'28"N; 66°58'14"W
106	ME	Rd 120 57SP06	296, 35 SW	321, 90	R TOP TO NE	30, 240			18°8'28"N; 66°58'14"W
107	ME	Rd 120 57SP06	301, 30 NE	319, 56 NE	T TOP TO SW	25, 068			18°8'28"N; 66°58'14"W
108	ME	Rd 120 57SP06	299, 40 NE	297, 61 NE	R? TOP TO SW	40, 022			18°8'28"N; 66°58'14"W
109	ME	Rd 120 60SP06	313, 38 sw	PARALLEL	?			1.5 m thick	18°8'58"N; 66°58'55"W
110	ME	Rd 120 60SP06	250, 42 NW		TOP TO E?			DRAGGED FOL., 1 M THICK	18°8'58"N; 66°58'55"W
111	ME	Rd 120 61SP06	238, 44 NW	235, 85 SE	R? TOP TO SE	44, 322		CUTS F121; 20 CM THICK	18°8'52"N; 66°59'7"W
112	ME	Rd 120 63SP06	172, 46 NE	176, 15 NE	N	46, 080	44, 108	CUTS FS71	18°8'56"N; 66°59'14"W
113	ME	Rd 120 64SP06	245, 22 SE	PARALLEL	TOP TO SW		14, 245		18°8'53"N; 66°59'23"W
114	ME	Rd 120 65SP06	321, 80 NE	296, 83 SW	RL??	33, 327	17, 334		18°9'6"N; 66°59'38"W
115	ME	Rd 120 65SP06	299, 85 NE	325, 60 NE	LL-N	49, 305			18°9'6"N; 66°59'38"W
116	ME	Rd 120 65SP06	292, 42 SW	PARALLEL	R??				18°9'6"N; 66°59'38"W
117	ME	Rd 120 65SP06	295, 37 SW	298, 57 SW	R	36, 214			18°9'6"N; 66°59'38"W
118	ME	Rd 120 66SP06	290, 46 NE	290, 66 NE	LL	46, 020	27, 299		18°9'12"N; 66°59'40"W
119	ME	Rd 120 66SP06	284, 83 SW	288, 87 NE	R	67, 267	84, 177		18°9'12"N; 66°59'40"W
120	ME	Rd 120 66SP06	174, 28 NE	254, 54 NW	RL	13, 150			18°9'12"N; 66°59'40"W
121	ME	Rd 120 67SP06	295, 37 NE	282, 66 NE	TOP TO SE	33, 357	01, 115		18°9'16"N; 66°59'43"W
122	ME	Rd 120 67SP06	165, 54 NE	310, 70 NE	RL	15, 356			18°9'16"N; 66°59'43"W
123	ME	Rd 120 68SP06	180, 50 E	328, 54 NE	RL	01, 179			18°9'18"N; 66°59'45"W
124	ME	Rd 120 70SP06	223, 32 NW	PARALLEL	N??		32, 300	CUTS F151; STRIAE VAR. DIR.	18°9'22"N; 66°59'53"W
125	ME	Rd 120 70SP06	255, 79 NW	300, 70 NE	LL TOP TO W	18, 258			18°9'22"N; 66°59'53"W
126	ME	Rd 120 70SP06	248, 89 NW	275, 77 SW	LL-R TOP TO SW	29, 067	35, 071		18°9'22"N; 66°59'53"W
127	ME	Rd 120 70SP06	220, 47 NW	230, 62 NW	TOP TO SE	38, 353			18°9'22"N; 66°59'53"W

128	ME	Rd 120 70SP06	188, 09 NW	243, 47 NW	TOP TO S	04, 342			18°9'22"N; 66°59'53"W
129	ME	Rd 120 70SP06	264, 15 SE	220, 46 NW	TOP TO S	12, 137			18°9'22"N; 66°59'53"W
130	ME	Rd 120 70SP06	280, 15 SW	234, 25 NW	TOP TO S	12, 158			18°9'22"N; 66°59'53"W
131	ME	Rd 120 70SP06	306, 50 SW	348, 65 SW	N-LL TOP TO SE	50, 226			18°9'22"N; 66°59'53"W
132	ME	Rd 120 70SP06	308, 55 SW	168, 47 SW	N-LL TOP TO SE	22, 142	22, 155		18°9'22"N; 66°59'53"W
133	ME	Rd 120 72SP06	284, 89 SW	306, 76 SW	LL?	32, 104			18°9'27"N; 66°59'56"W
134	ME	Rd 120 72SP06	296, 82 SW	321, 67 SW	LL	35, 122	30, 121		18°9'27"N; 66°59'56"W
135	ME	Rd 120 72SP06	175, 60 SW	314, 47 SW	RL	29, 336	02, 002	MAP IT	18°9'28"N; 66°59'56"W
136	ME	Rd 120 72SP06	000, 80 W	316, 78 SW	RL	07, 359	02, 178	MAP IT	18°9'28"N; 66°59'56"W
137	ME	Rd 120 73SP06	331, 78 SW	332, 50 SW	RL	07, 232			18°9'29"N; 66°59'57"W
138	ME	Rd 120 73SP06	264, 73 SE	320, 88 NE	LL	13, 260		CUTS F188 AND SH139	18°9'29"N; 66°59'57"W
139	ME	Rd 120 73SP06	278, 45 SW	239, 68 SE	R	16, 115	45, 192		18°9'29"N; 66°59'57"W
140	ME	Rd 120 73SP06	277, 70 SW	311, 89 SW	LL	24, 268	38, 264		18°9'29"N; 66°59'57"W
141	ME	Rd 120 73SP06	226, 87 NW	267, 72 SE	TOP TO SW	29, 045	17, 222		18°9'29"N; 66°59'57"W
142	ME	Rd 120 73SP06	287, 84 SW	314, 90	LL	11, 286			18°9'29"N; 66°59'57"W
143	ME	Rd 120 74SP06	284, 45 SW	PARALLEL	?				18°9'34"N; 66°59'58"W
144	ME	Rd 120 74SP06	270, 78 N	298, 82 SW	LL TOP TO W	33, 082		CUTS SH145	18°9'34"N; 66°59'58"W
145	ME	Rd 120 74SP06	238, 52 NW	289, 80 NE	TOP TO SW	14, 047			18°9'34"N; 66°59'58"W
146	ME	Rd 120 74SP06	302, 40 SW	273, 65 SW	R TOP TO N	23, 152			18°9'34"N; 66°59'58"W
147	ME	Rd 120 74SP06	282, 75 SW	315, 64 SW	LL-N TOP TO SE	24, 109		CUTS F202	18°9'34"N; 66°59'58"W
148	ME	Rd 120 74SP06	117, 09 NE	095, 65 NE	TOP TO SW	08, 002			18°9'34"N; 66°59'58"W
149	ME	Rd 120 74SP06	328, 78 NE	302, 86 NE	RL	15, 331			18°9'34"N; 66°59'58"W
150	ME	Rd 120 74SP06	271, 70 NE	297, 86 NE	LL	27, 080			18°9'34"N; 66°59'58"W
151	ME	Rd 120 75SP06	318, 65 SW	315, 78 SW	TOP TO NE	62, 198			18°9'37"N; 66°59'57"W
152	ME	Rd 120 75SP06	297, 54 NE	316, 82 NE	TOP TO NW	41, 079	04, 303		18°9'37"N; 66°59'57"W
153	ME	Rd 120 75SP06	258, 62 NW	301, 67 NE	TOP TO W	02, 259			18°9'37"N; 66°59'57"W
154	ME	Rd 120 75SP06	271, 45 SW	219, 86 SE					18°9'37"N; 66°59'57"W
155	ME	Rd 120 76SP06	204, 10 NW	333, 53 NE	TOP TO	07, 247			18°9'40"N; 66°59'50"W

					W				
156	ME	Rd 120 76SP06	335, 62 NE	182, 81 SE	LL TOP TO N	28, 139			18°9'40"N; 66°59'50"W
157	ME	Rd 120 76SP06	132, 52 NE	155, 56 NE	R TOP TO SW	04, 129		MAP IT	18°9'40"N; 66°59'50"W
158	ME	Rd 120 76SP06	230, 29 NW	PARALLEL	?				18°9'40"N; 66°59'50"W
159	ME	Rd 120 77SP06	309, 42 SW	318, 69 SW	TOP TO E	39, 243			18°9'42"N; 66°59'47"W
160	ME	Rd 120 78SP06	306, 70 SW	341, 78 SW	TOP TO NE	07, 304	71, 184	CUTS F218	18°9'43"N; 66°59'43"W
161	ME	Rd 120 78SP06	337, 62 SW	176, 67 NE	R TOP TO E	55, 287		BIG	18°9'43"N; 66°59'43"W
162	ME	Rd 120 78SP06	350, 30 SW	026, 69 NW	TOP TO SE	25, 298		BIG, CUTS F222	18°9'43"N; 66°59'43"W
163	ME	Rd 120 78SP06	288, 77 SW	332, 78 SW	LL?	04, 108			18°9'43"N; 66°59'43"W
164	ME	Rd 120 78SP06	334, 50 SW	344, 73 SW	R TOP TO E	44, 279	43, 282	MAP IT	18°9'43"N; 66°59'43"W
165	ME	Rd 120 78SP06	302, 47 SW	322, 75 SW	R-LL TOP TO NE	35, 260			18°9'43"N; 66°59'43"W
166	ME	Rd 120 79SP06	336, 33 NE	292, 56 SW	TOP TO NE	27, 026		CUTS F226, F227	18°9'47"N; 66°59'41"W
167	ME	Rd 120 79SP06	292, 29 NE	260, 29 SE	N TOP TO NE	27, 001	26, 060		18°9'47"N; 66°59'41"W
168	ME	Rd 120 79SP06	321, 34 NE	PARALLEL	?				18°9'47"N; 66°59'41"W
169	ME	Rd 120 79SP06	246, 59 NW	285, 40 NE	TOP TO N	37, 273			18°9'47"N; 66°59'41"W
170	ME	Rd 120 79SP06	335, 28 NE	304, 54 NE	TOP TO S	18, 010	20, 042		18°9'47"N; 66°59'41"W
171	ME	Rd 120 79SP06	260, 44 SE	273, 81 SW	R TOP TO N	41, 197			18°9'47"N; 66°59'41"W
172	ME	Rd 120 79SP06	310, 36 SW	325, 68 SW	R TOP TO E	32, 251			18°9'47"N; 66°59'41"W
173	ME	Rd 120 79SP06	350, 34 NE	286, 43 NE	TOP TO SE	09, 158			18°9'47"N; 66°59'41"W
174	ME	Rd 120 80SP06	211, 04 SE	257, 30 NW	TOP TO SE	03, 162			18°9'55"N; 66°59'42"W
175	ME	Rd 120 80SP06	297, 31 NE	224, 33 SE	N TOP TO N	23, 340	30, 338	CUTS F243 AND F244	18°9'55"N; 66°59'42"W
176	ME	Rd 120 80SP06	264, 72 NW	304, 40 NE	TOP TO NW	50, 288			18°9'55"N; 66°59'42"W
177	ME	Rd 120 80SP06	264, 42 NW	238, 70 NW	R TOP TO SE	27, 299		CUTS FS116 ??	18°9'55"N; 66°59'42"W
178	ME	Rd 120 80SP06	278, 27 NE	214, 30 SE	N TOP TO N	21, 328			18°9'55"N; 66°59'42"W
179	ME	Rd 120 80SP06	268, 38 NW	237, 57 NW	R	17, 291			18°9'55"N; 66°59'42"W

180	ME	Rd 120 80SP06	245, 82 SE	268, 73 NW	LL	45, 269		CUTS SH179	18°9'55"N; 66°59'42"W
181	ME	Rd 120 80SP06	283, 18 SW	325, 63 SW	R TOP TO E	12, 245			18°9'55"N; 66°59'42"W
182	ME	Rd 120 81SP06	248, 60 SE	305, 85 SW	LL	11, 241	09, 063		18°10'1"N; 66°59'36"W
183	ME	Rd 120 81SP06	265, 80 SE	267, 60 NW	TOP TO W	80, 192			18°10'1"N; 66°59'36"W
184	ME	Rd 120 81SP06	234, 83 NW	258, 83 NW	LL	01, 234		TOP TO SW	18°10'1"N; 66°59'36"W
185	ME	Rd 120 82SP06	310, 36 NE	328, 57 NE	TOP TO NW	27, 084	36, 107		18°10'3"N; 66°59'35"W
186	ME	Rd 120 82SP06	296, 84 SW	324, 76 NE	LL TOP TO NW	35, 292			18°10'3"N; 66°59'35"W
187	ME	Rd 120 82SP06	249, 54 NW	260, 65 NW	R TOP TO S	36, 037	09, 254	CUTS F258	18°10'3"N; 66°59'35"W
188	ME	Rd 120 82SP06	293, 80 NE	335, 83 NE	LL	01, 113	32, 104	CUTS F259 AND F260 ?	18°10'3"N; 66°59'35"W
189	ME	Rd 120 82SP06	301, 47 NE	319, 72 NE	TOP TO NW	36, 079			18°10'3"N; 66°59'35"W
190	ME	Rd 120 82SP06	263, 76 NW	310, 72 SW	LL TOP TO W	32, 074			18°10'3"N; 66°59'35"W
191	ME	Rd 120 82SP06	290, 86 NE	315, 73 SW	LL??	41, 106			18°10'3"N; 66°59'35"W
192	ME	Rd 120 82SP06	292, 63 NE	305, 76 NE	LL TOP TO NW	38, 089			18°10'3"N; 66°59'35"W
193	ME	Rd 120 82SP06	327, 81 NE	PARALLEL	?				18°10'3"N; 66°59'35"W
194	ME	Rd 362 83SP06	316, 38 NE	328, 85 SW	R TOP TO S	37, 064		CUTS F265 AND F268	18°08'44"N; 66°58'10"W
195	ME	Rd 362 83SP06	336, 44 SW	324, 20 SW	N TOP TO S	43, 260		BIG CUTS FS125	18°08'44"N; 66°58'10"W
196	ME	Rd 362 84SP06	248, 42 NW	318, 74 NE	LL-R TOP TO W	03, 065			18°08'31"N; 66°58'17"W
197	ME	Rd 362 84SP06	311, 37 NE	328, 61 NE	R TOP TO SW	30, 081	29, 066		18°08'31"N; 66°58'17"W
198	ME	Rd 362 84SP06	332, 86 SW	309, 83 NE	RL TOP TO NW	26, 154			18°08'31"N; 66°58'17"W
199	ME	Rd 362 84SP06	321, 78 NE	PARALLEL	RL???				18°08'31"N; 66°58'17"W
200	ME	Rd 362 84SP06	343, 78 NE	320, 65 NE	RL	33, 155	62, 140		18°08'31"N; 66°58'17"W
201	ME	Rd 362 85SP06	320, 70 SW	295, 76 NE	RL? TOP TO NW	48, 164	15, 156	BIG	18°08'31"N; 66°58'07"W
202	ME	Rd 362 85SP06	269, 85 NW	280, 62 NE	N	66, 281			18°08'31"N; 66°58'07"W
203	ME	Rd 362 85SP06	293, 88 SW	297, 55 NE	R???	85, 273	66, 330		18°08'31"N; 66°58'07"W
204	ME	Rd 362 85SP06	310, 66 NE	PARALLEL	?		STEEP		18°08'31"N; 66°58'07"W
205	ME	Rd 362 85SP06	310, 66 NE	PARALLEL	?				18°08'31"N; 66°58'07"W

206	ME	Rd 362 86SP06	290, 37 SW	286, 68 SW	R TOP TO N	37, 191			18°08'26"N; 66°58'08"W
207	ME	Rd 362 86SP06	312, 76 NE	288, 39 NE	N	63, 102	69, 018		18°08'26"N; 66°58'08"W
208	ME	Rd 362 86SP06	298, 81 SW	290, 52 NE	R TOP TO NE	78, 167	80, 132	FAULT BRECCIA	18°08'26"N; 66°58'08"W
							73, 316		
209	ME	Rd 362 86SP06	301, 07 SW	217, 35 NW	THRUST TOP TO SE	02, 137	22, 337		18°08'26"N; 66°58'08"W
210	ME	Rd 362 86SP06	293, 12 SW	234, 34 NW	TOP TO SE	08, 156			18°08'26"N; 66°58'08"W
211	ME	Rd 362 86SP06	274, 26 NE	275, 44 NE	TOP TO SE	26, 006		CUTS FS130 AND FS131	18°08'26"N; 66°58'08"W
212	ME	Rd 362 86SP06	295, 28 SW	240, 46 NW	TOP TO SE	21, 161			18°08'26"N; 66°58'08"W
213	ME	Rd 362 86SP06	229, 19 NW	280, 48 NE	TOP TO SW	07, 029		FAULT BRECCIA	18°08'26"N; 66°58'08"W
214	ME	Rd 362 86SP06	279, 43 SW	260, 12 NW	TOP TO S	43, 183			18°08'26"N; 66°58'08"W
215	ME	Rd 366 87SP06	210, 39 NW	PARALLEL	?		18, 035	CUTS F311	18°08'32"N; 66°57'34"W
216	ME	Rd 366 88SP06	349, 36 SW	326, 69 SW	TOP TO NNE	28, 216			18°08'35"N; 66°57'30"W
217	ME	Rd 366 88SP06	318, 22 SW	319, 64 SW	TOP TO NE	27, 307		CUTS F314	18°08'35"N; 66°57'30"W
218	ME	Rd 366 88SP06	199, 20 NW	312, 81 SW	TOP TO NE	06, 217			18°08'35"N; 66°57'30"W
219	ME	Rd 366 88SP06	336, 30 SW	307, 60 SW	TOP TO NE	20, 196			18°08'35"N; 66°57'30"W
220	ME	Rd 366 88SP06	175, 20 SW	310, 51 SW	TOP TO NE	10, 202			18°08'35"N; 66°57'30"W
221	ME	Rd 366 88SP06	312, 12 NE	306, 47 NE	TOP TO SW	11, 035			18°08'35"N; 66°57'30"W
222	ME	Rd 366 91SP06	260, 58 NW	325, 64 NE	LL-N TOP TO NW	10, 266			18°08'42"N; 66°57'12"W
223	ME	Rd 366 91SP06	289, 20 NE	329, 54 NE	TOP TO NW	12, 074			18°08'42"N; 66°57'12"W
224	ME	Rd 366 91SP06	303, 34 NE	322, 71 NE	R TOP TO WSW	29, 067			18°08'42"N; 66°57'12"W
225	ME	Rd 366 92SP06	309, 46 NE	325, 54 NE	TOP TO W	20, 109		CUTS F316 AND F317	18°08'42"N; 66°57'09"W
226	ME	Rd 366 92SP06	182, 80 NW	335, 70 NE	TOP TO ENE	47, 193			18°08'42"N; 66°57'09"W
227	ME	Rd 366 92SP06	320, 56 NE	268, 32 NW	N TOP TO E	40, 105	24, 004	YOUNG?	18°08'42"N; 66°57'09"W
228	ME	Rd 366 92SP06	290, 38 NE	189, 55 SE	R TOP TO	10, 303			18°08'42"N; 66°57'09"W

					WNW				
229	ME	Rd 366 93SP06	288, 42 NE	292, 60 NE	TOP TO SW	41, 032		1 M THICK	18°08'44"N; 66°57'09"W
230	ME	Rd 366 93SP06	294, 37 NE	PARALLEL	?				18°08'44"N; 66°57'09"W
231	ME	Rd 366 93SP06	246, 34 NW	285, 44 NE	R	03, 061		CUTS F325	18°08'44"N; 66°57'09"W
232	ME	Rd 366 93SP06	294, 68 NE	290, 89 NE	TOP TO SW	66, 357	58, 066		18°08'44"N; 66°57'09"W
233	ME	Rd 366 93SP06	141, 90	141, 69 NE	RL	90, 276			18°08'44"N; 66°57'09"W
234	ME	Rd 366 93SP06	301, 60 NE	266, 32 NW	RL-N	49, 081			18°08'44"N; 66°57'09"W
235	ME	Rd N OF366 96SP06	272, 25 SW	258, 72 SE	TOP TO NW	23, 163	22, 155		18°08'52"N; 66°57'04"W
236	ME	Rd N OF366 96SP06	140, 10 SW	142, 72 SW	TOP TO NE	10, 232			18°08'52"N; 66°57'04"W
237	ME	Rd N OF366 96SP06	352, 43 SW	328, 88 SW	TOP TO NE	36, 221			18°08'52"N; 66°57'04"W
238	ME	Rd N OF 366 97SP06	324, 48 NE	269, 30 NW	N TOP TO SE	34, 108			18°09'00"N; 66°57'04"W
239	ME	Rd N OF 366 97SP06	287, 22 NE	315, 41 SW	N? TOP TO NE	21, 039			18°09'00"N; 66°57'04"W
240	ME	Rd N OF 366 97SP06	322, 34 NE	010, 28 NW	N? TOP TO NE	31, 082		CUTS SH241	18°09'00"N; 66°57'04"W
241	ME	Rd N OF 366 97SP06	326, 78 NE	330, 67 SW	R TOP TO WSW	77, 084			18°09'00"N; 66°57'04"W
242	ME	Rd N OF 366 98SP06	252, 18 NW	278, 42 NE	T TOP TO S	14, 024			18°09'04"N; 66°57'01"W
243	ME	Rd N OF 366 98SP06	320, 36 NE	286, 43 NE	R	02, 323	24, 019	CUTS F335	18°09'04"N; 66°57'01"W
244	ME	Rd N OF 366 98SP06	237, 32 NW	253, 65 NW	R TOP TO S	28, 356			18°09'04"N; 66°57'01"W
245	ME	Rd N OF 366 100SP06	282, 60 NE	324, 68 SW	TOP TO SW	39, 074			18°09'08"N; 66°57'00"W
246	ME	Rd N OF 366 100SP06	290, 68 NE	309, 80 SW	TOP TO SW	52, 080			18°09'08"N; 66°57'00"W
247	ME	Rd N OF 366 100SP06	339, 42 SW	317, 62 SW	TOP TO NE	26, 192			18°09'08"N; 66°57'00"W
248	ME	Rd N OF 366 100SP06	302, 65 NE	302, 88 NE	R TOP TO SW	65, 032			18°09'08"N; 66°57'00"W
249	ME	Rd N OF 366 100SP06	259, 88 NW	282, 85 SW	LL TOP TO W	17, 078			18°09'08"N; 66°57'00"W
250	ME	Rd N OF 366 100SP06	262, 38 NW	287, 89 SW	R TOP TO SW	32, 029	33, 028		18°09'08"N; 66°57'00"W
251	ME	Rd N OF 366 100SP06	233, 38 SE	245, 77 SE	TOP TO NW	35, 166			18°09'08"N; 66°57'00"W
252	ME	Rd 365 102SP06	260, 43 NW	305, 40 NE	N TOP TO NNW	15, 277			18°06'17"N; 66°55'18"W

253	ME	Rd 365 102SP06	230, 45 NW	289, 34 NE	N TOP TO NW	26, 259	38, 282		18°06'17"N; 66°55'18"W
254	ME	Rd 365 104SP06	215, 56 NW	270, 22 N	N TOP TO NW	48, 264		BIG, GOUGE	18°06'14"N; 66°55'17"W
255	ME	Rd 365 104SP06	218, 31 SE	271, 52 SW	TOP TO NE	04, 212		CUTS F352	18°06'14"N; 66°55'17"W
256	ME	Rd 365 105SP06	281, 46 NE	285, 29 NE	N TOP TO N	46, 001		BIG, GOUGE, CUTS F355	18°06'13"N; 66°55'17"W
257	ME	Rd 365 106SP06	297, 44 NE	286, 67 NE	R TOP TO S	39, 355			18°06'10"N; 66°55'19"W
258	ME	Rd 365 106SP06	278, 34 NE	296, 72 NE	R TOP TO S	30, 040			18°06'10"N; 66°55'19"W
259	ME	Rd 365 107SP06	288, 33 NE	275, 58 NE	R TOP TO S	30, 348			18°06'09"N; 66°55'22"W
260	ME	Rd 365 108SP06	310, 27 NE	294, 48 NE	T TOP TO S	23, 005			18°06'11"N; 66°55'30"W
261	ME	Rd 365 108SP06	319, 31 NE	272, 60 NE	R TOP TO S	11, 338			18°06'11"N; 66°55'30"W
262	ME	Rd 365 108SP06	302, 49 NE	280, 78 SW	R TOP TO SE	43, 355			18°06'11"N; 66°55'30"W
263	ME	Rd 365 108SP06	274, 65 NE	290, 46 NE	N TOP TO N	52, 310			18°06'11"N; 66°55'30"W
264	ME	Rd 365 108SP06	290, 60 NE	318, 42 NE	N TOP TO N	40, 319	56, 338		18°06'11"N; 66°55'30"W
265	ME	Rd 365 108SP06	280, 60 SW	288, 67 NE	R TOP TO NE	58, 208			18°06'11"N; 66°55'30"W
266	ME	Rd 365 108SP06	288, 43 NE	218, 35 SE	N TOP TO N	32, 332		CUTS FS182	18°06'11"N; 66°55'30"W
267	ME	Rd 365 108SP06	275, 65 NE	290, 49 NE	N TOP TO N	48, 307			18°06'11"N; 66°55'30"W
268	ME	Rd 365 109SP06	268, 65 SE	135, 76 SW	LL TOP TO E	04, 266		3 M THICK	18°06'08"N; 66°55'31"W
269	ME	Rd 365 109SP06	275, 25 SW	296, 66 SW	T TOP TO NE	22, 216			18°06'08"N; 66°55'31"W
270	ME	Rd 365 109SP06	260, 90	280, 70 NE	LL	47, 260			18°06'08"N; 66°55'31"W
271	ME	Rd 365 109SP06	316, 50 NE	301, 70 NE	R TOP TO SW	37, 356			18°06'08"N; 66°55'31"W
272	ME	Rd 365 109SP06	320, 60 NE	302, 84 NE	R TOP TO SW	42, 352	56, 009		18°06'08"N; 66°55'31"W
273	ME	Rd 365 109SP06	260, 44 NW	280, 69 SW	R TOP TO NE	41, 017			18°06'08"N; 66°55'31"W
274	ME	Rd 365 109SP06	270, 84 S	308, 83 SW	LL	04, 090	13, 270		18°06'08"N; 66°55'31"W
275	ME	Rd 365 109SP06	330, 33 NE	292, 65 NE	R TOP TO SW	17, 359			18°06'08"N; 66°55'31"W
276	ME	Rd 365 109SP06	294, 20 NE	278, 35 NE	T TOP TO	16, 349			18°06'08"N; 66°55'31"W

					SW				
277	ME	Rd 365 109SP06	318, 45 NE	290, 85 NE	R TOP TO SW	33, 358			18°06'08"N; 66°55'31"W
278	ME	Rd 365 109SP06	292, 68 NE	302, 50 NE	LL-N???	59, 334			18°06'08"N; 66°55'31"W
279	ME	Rd 365 109SP06	260, 68 NW	288, 35 NE	N	57, 299		1 CM THICK, BIG FAULT	18°06'08"N; 66°55'31"W
280	ME	Rd 365 110SP06	314, 15 SW	284, 53 SW	T TOP TO NE	12, 185	15, 223		18°06'06"N; 66°55'32"W
281	ME	Rd 365 110SP06	259, 18 NW	278, 40 NE	T TOP TO S	15, 021			18°06'06"N; 66°55'32"W
282	ME	Rd 365 110SP06	317, 74 NE	300, 80 NE	RL TOP TO SE	17, 322			18°06'06"N; 66°55'32"W
283	ME	Rd 365 110SP06	303, 46 NE	288, 67 NE	R TOP TO S	35, 348		CUTS F360 AND SH284	18°06'06"N; 66°55'32"W
284	ME	Rd 365 110SP06	265, 88 SE	276, 54 NE	LL-N???	76, 255			18°06'06"N; 66°55'32"W
285	ME	Rd 365 110SP06	308, 22 NE	315, 66 NE	T TOP TO SW	21, 048			18°06'06"N; 66°55'32"W
286	ME	Rd 365 110SP06	261, 60 SE	301, 56 NE	R TOP TO NE	46, 225			18°06'06"N; 66°55'32"W
287	ME	Rd 365 110SP06	272, 49 NE	288, 31 NE	N	43, 328	39, 316		18°06'06"N; 66°55'32"W
289	ME	Rd 365 111SP06	272, 37 NE	295, 27 NE	N TOP TO NNW	27, 314		3 M THICK; GOUGE	18°06'04"N; 66°55'36"W
290	ME	Rd 365 111SP06	303, 58 SW	310, 90	R TOP TO NE	56, 237			18°06'04"N; 66°55'36"W
291	ME	Rd 365 111SP06	204, 32 SE	310, 68	R TOP TO SW	00, 205			18°06'04"N; 66°55'36"W
292	ME	Rd 365 112SP06	268, 68 NW	272, 50 NE	N	66, 333	68, 299		18°05'56"N; 66°55'39"W
293	ME	Rd 365 114SP06	250, 48 SE	252, 28 SE	N TOP TO S	48, 156			18°05'48"N; 66°55'38"W
294	ME	Rd 365 115SP06	298, 21 NE	228, 26 NW	TOP TO E	08, 096			18°05'45"N; 66°55'35"W
295	ME	Rd 365 116SP06	264, 73 NW	287, 70 NE	LL TOP TO W	11, 268			18°04'57"N; 66°56'21"W
296	ME	Rd 365 117SP06	286, 55 SW	296, 88 SW	TOP TO NE	51, 226			18°04'54"N; 66°56'22"W
297	ME	Rd 365 117SP06	291, 08 NE	289, 30 NE	T TOP TO S	08, 018		CUTS F378	18°04'54"N; 66°56'22"W
298	ME	Rd 365 117SP06	270, 58 S	281, 80 NE	LL TOP TO E	54, 208		CUTS SH297	18°04'54"N; 66°56'22"W
299	ME	Rd 365 118SP06	290, 18 SW	321, 65 SW	T TOP TO NE	14, 239			18°04'47"N; 66°56'27"W
300	ME	Rd 365 118SP06	265, 75 SE	289, 86 SW	LL TOP TO E	22, 259			18°04'47"N; 66°56'27"W
301	ME	Rd 365 119SP06	296, 18 NE	217, 34 NW	T TOP TO SE	05, 100		CUTS F385	18°04'47"N; 66°56'27"W

302	ME	Rd 365 119SP06	253, 31 NW	238, 51 NW	R TOP TO SE	26, 307		18°04'47"N; 66°56'27"W
303	ME	Rd 365 119SP06	265, 39 NW	221, 50 NW	R TOP TO SE	01, 267		18°04'47"N; 66°56'27"W
304	ME	Rd 364 120SP06	328, 09 NE	268, 40 NW	T TOP TO SE	08, 085		18°06'40"N; 66°56'11"W
305	ME	Rd 364 120SP06	249, 22 SE	305, 12 NE	N TOP TO S	20, 181	20, 206; N AND T?	18°06'40"N; 66°56'11"W
306	ME	Rd 364 120SP06	314, 12 NE	260, 28 NW	T TOP TO SE	02, 327		18°06'40"N; 66°56'11"W
307	ME	Rd 364 121SP06	219, 16 SE	310, 34 NE	T TOP TO SW	06, 199		18°06'28"N; 66°56'11"W
308	ME	Rd 364 121SP06	334, 22 NE	280, 20 SW	N TOP TO NE	19, 035		18°06'28"N; 66°56'11"W
309	ME	Rd 364 122SP06	195, 65 SE	210, 26 SE	R TOP TO NW	63, 083		18°06'23"N; 66°56'13"W
310	ME	Rd 364 123SP06	306, 52 NE	340, 59 NE	LL TOP TO NW	03, 124		18°06'05"N; 66°56'06"W
311	ME	Rd 364 124SP06	198, 15 SE	183, 47 SE	T TOP TO SW	14, 087	CUTS F399	18°06'02"N; 66°56'10"W
312	ME	Rd 364 124SP06	311, 75 NE	319, 50 NE	N TOP TO NE	69, 356		18°06'02"N; 66°56'10"W
313	ME	Rd 364 124SP06	318, 67 NE	348, 26 NE	N TOP TO NE	61, 009		18°06'02"N; 66°56'10"W
314	ME	Rd 364 124SP06	306, 72 NE	300, 71 SW	R TOP TO SW	70, 008		18°06'02"N; 66°56'10"W
315	ME	Rd 364 124SP06	330, 72 NE	326, 44 NE	N TOP TO NE	71, 080	CUTS SH316 ?	18°06'02"N; 66°56'10"W
316	ME	Rd 364 124SP06	198, 07 SE	340, 35 NE	T TOP TO SW	05, 063		18°06'02"N; 66°56'10"W
317	ME	Rd 364 124SP06	300, 72 NE	338, 65 NE	N TOP TO NE	17, 306	10 CM THICK	18°06'02"N; 66°56'10"W
318	ME	Rd 364 124SP06	248, 16 SW	290, 35 NE	TOP TO S	14, 190		18°06'02"N; 66°56'10"W
319	ME	Rd 364 124SP06	328, 74 SW	285, 37 SW	N TOP TO SW	54, 304		18°06'02"N; 66°56'10"W
320	ME	Rd 364 124SP06	266, 23 SE	192, 28 SE	TOP TO NW	10, 241		18°06'02"N; 66°56'10"W
321	ME	Rd 364 124SP06	334, 53 NE	178, 41 NE	TOP TO NE	33, 002		18°06'02"N; 66°56'10"W
322	ME	Rd 364 124SP06	322, 69 NE	325, 40 NE	TOP TO NE	69, 046		18°06'02"N; 66°56'10"W
323	ME	Rd 364 124SP06	340, 73 NE	190, 53 SE	TOP TO NE	41, 356		18°06'02"N; 66°56'10"W
324	ME	Rd 364 124SP06	329, 77 NE	337, 35 NE	TOP TO N	75, 029		18°06'02"N; 66°56'10"W

325	ME	Rd 364 124SP06	235, 23 SE	345, 44 NE	TOP TO SW	02, 230			18°06'02"N; 66°56'10"W
326	ME	Rd 364 124SP06	335, 85 NE	346, 80 NE	TOP TO NE??	25, 338	56, 150	CUTS SH325	18°06'02"N; 66°56'10"W
327	ME	Rd 364 124SP06	317, 68 NE	312, 54 NE	TOP TO NE	63, 085		BIG; 1 M THICK	18°06'02"N; 66°56'10"W
328	ME	Rd 364 124SP06	204, 52 SE	220, 15 SE	TOP TO E	52, 104		BIG	18°06'02"N; 66°56'10"W
329	ME	Rd 364 124SP06	324, 29 NE	340, 70 NE	T TOP TO SW	27, 080			18°06'02"N; 66°56'10"W
330	ME	Rd 364 124SP06	326, 20 NE	306, 33 NE	TOP TO SW	14, 010			18°06'02"N; 66°56'10"W
331	ME	Rd 364 124SP06	336, 61 NE	310, 35	TOP TO NE	50, 115			18°06'02"N; 66°56'10"W
332	ME	Rd 364 125SP06	213, 65 SE	226, 15 SE	N TOP TO SE	65, 112		CUTS F403 AND F404	18°05'56"N; 66°56'15"W
333	ME	Rd 364 125SP06	242, 20 SE	294, 35 NE	N TOP TO S		18, 199	CUTS F403 AND F404	18°05'56"N; 66°56'15"W
334	ME	Rd 364 126SP06	332, 17 SW	175, 22 NE	N TOP TO SW	17, 256			18°05'21"N; 66°56'53"W
335	ME	Rd 362 127SP06	346, 39 SW	308, 38 NE	TOP TO SW	35, 226			18°08'20"N; 66°58'09"W
336	ME	Rd 362 127SP06	284, 05 SW	306, 54 NE	TOP TO SW	05, 215		CUTS SH335	18°08'20"N; 66°58'09"W
337	ME	Rd 362 127SP06	317, 37 SW	307, 33 SW	TOP TO SW	22, 282			18°08'20"N; 66°58'09"W
338	ME	Rd 362 127SP06	315, 43 SW	355, 20 SW	TOP TO SW?	38, 191			18°08'20"N; 66°58'09"W
339	ME	Rd 362 127SP06	260, 13 NW	304, 39 NE	TOP TO SW	07, 049			18°08'20"N; 66°58'09"W
340	ME	Rd 362 127SP06	260, 05 NW	293, 35 NE	TOP TO S	04, 027			18°08'20"N; 66°58'09"W
341	ME	Rd 362 127SP06	288, 20 NE	316, 56 NE	TOP TO SW	16, 057			18°08'20"N; 66°58'09"W
342	ME	Rd 362 127SP06	147, 38 NE	315, 42 NE	TOP TO SW	13, 345			18°08'20"N; 66°58'09"W
343	ME	Rd 362 128SP06	314, 50 SW	325, 35 SW	TOP TO SW	45, 191	50, 181		18°08'19"N; 66°58'11"W
344	ME	Rd 362 128SP06	205, 08 SE	337, 24 NE	TOP TO SW	04, 050	03, 029	CUTS F412	18°08'19"N; 66°58'11"W
345	ME	Rd 362 128SP06	310, 37 NE	308, 76 NE	TOP TO S	37, 037			18°08'19"N; 66°58'11"W
346	ME	Rd 362 129SP06	328, 44 SW	262, 51 SE	TOP TO NW	11, 316			18°08'16"N; 66°58'13"W
347	ME	Rd 362 129SP06	298, 70 SW	272, 78 SW	TOP TO NW?	13, 123			18°08'16"N; 66°58'13"W
348	ME	Rd 362 129SP06	190, 30 NW	292, 40 SW	TOP TO N	11, 350		CUTS F417	18°08'16"N; 66°58'13"W

349	ME	Rd 362 129SP06	310, 38 SW	332, 35 SW	TOP TO N	13, 148	38, 310		18°08'16"N; 66°58'13"W
							09, 214		
350	ME	Rd 362 130SP06	294, 17 SW	300, 24 NE	TOP TO SW	17, 208			18°08'11"N; 66°58'15"W
351	ME	Rd 362 131SP06	264, 30 NW	242, 65 NW	TOP TO SE; OLD	25, 316	05, 079; TOP TO E; YOUNG	BIG TRACE; CUTS F22	18°08'07"N; 66°58'15"W
352	ME	Rd 362 131SP06	281, 47 SW	268, 82 SE	TOP TO N	42, 161			18°08'07"N; 66°58'15"W
353	ME	Rd 362 131SP06	262, 90	296, 66 SW	NORTH SIDE UP	39, 082		SMALL	18°08'07"N; 66°58'15"W
354	ME	Rd 362 133SP06	263, 25 SE	204, 08 NW	TOP TO SE	24, 157			18°08'02"N; 66°58'16"W
355	ME	Rd 362 133SP06	288, 44 SW	304, 11 SW	TOP TO SW	44, 190			18°08'02"N; 66°58'16"W
356	ME	Rd 362 133SP06	243, 58 SE	265, 33 SE	TOP TO SE	50, 111			18°08'02"N; 66°58'16"W
357	ME	Rd 362 133SP06	265, 60 SE	268, 21 SE	TOP TO SE	60, 172		BIG TRACE	18°08'02"N; 66°58'16"W
358	ME	Rd 362 133SP06	258, 35 SE	262, 64 SE	TOP TO NW	35, 177		1 M THICK	18°08'02"N; 66°58'16"W
359	ME	Rd 362 133SP06	242, 41 SE	270, 64 S	TOP TO NW	23, 213		1 M THICK	18°08'02"N; 66°58'16"W
360	ME	Rd 362 134SP06	300, 62 NE	302, 49 NE	TOP TO NE	61, 016	52, 078		18°08'01"N; 66°58'16"W
361	ME	Rd 362 135SP06	307, 44 NE	326, 65 NE	TOP TO SW	31, 089			18°07'55"N; 66°58'15"W
362	ME	Rd 362 135SP06	303, 33 NE	326, 62 NE	TOP TO SW	25, 077			18°07'55"N; 66°58'15"W
363	ME	Rd 362 135SP06	200, 18 SE	209, 11 NW	TOP TO SE	18, 113			18°07'55"N; 66°58'15"W
364	ME	Rd 362 139SP06	275, 80 SW	300, 62 SW	LL TOP TO SE	40, 104			18°07'58"N; 66°58'46"W
365	ME	Rd 362 139SP06	275, 90	285, 51 SW	NORTH SIDE UP	78, 095			18°07'58"N; 66°58'46"W
366	ME	Rd 362 139SP06	305, 57 SW	295, 71 SW	TOP TO NE	43, 163			18°07'58"N; 66°58'46"W
367	ME	Rd 362 140SP06	182, 67 SE	170, 35 NE	N TOP TO SE	64, 123			18°07'51"N; 66°58'59"W
368	ME	Rd 362 141SP06	026, 38 NW	175, 45 SW	TOP TO E	04, 211			18°07'49"N; 66°59'02"W
369	ME	Rd 362 142SP06	314, 76 NE	354, 78 NE	LL TOP TO NW	02, 315			18°07'45"N; 66°59'02"W

370	ME	Rd 362 142SP06	266, 70 SE	302, 54 SW	TOP TO SW	32, 100	57, 111	CUTS SH371	18°07'45"N; 66°59'02"W
371	ME	Rd 362 142SP06	340, 60 SW	312, 82 SW	R TOP TO NE	29, 179			18°07'45"N; 66°59'02"W
372	ME	Rd 362 142SP06	350, 35 SW	330, 46 SW	TOP TO NE	18, 198			18°07'45"N; 66°59'02"W
373	ME	VEREDA DESCANSO 145SP06	297, 24 SW	324, 35 SW	TOP TO NE	10, 272			18°09'09"N; 67°00'34"W
374	ME	VEREDA DESCANSO 145SP06	248, 27 SE	338, 50 SW	TOP TO NE	09, 087			18°09'09"N; 67°00'34"W
375	ME	VEREDA DESCANSO 145SP06	308, 34 SW	330, 62 SW	TOP TO NE	26, 261			18°09'09"N; 67°00'34"W
376	ME	VEREDA DESCANSO 146SP06	329, 87 SW	332, 75 NE	TOP TO NE	81, 313			18°09'07"N; 67°00'34"W
377	ME	VEREDA DESCANSO 147SP06	290, 25 SW	312, 40 SW	TOP TO NE	16, 250	31, 150		18°09'06"N; 67°00'37"W
378	ME	V. N OF DESCANSO 148SP06	313, 42 NE	PARALLEL	?				18°09'51"N; 67°01'03"W
379	ME	V. N OF DESCANSO 148SP06	315, 72 SW	PARALLEL	?				18°09'51"N; 67°01'03"W
380	ME	V. N OF DESCANSO 148SP06	208, 06 NW	269, 68 NW	TOP TO SW	02, 001			18°09'51"N; 67°01'03"W
381	ME	V. N OF DESCANSO 148SP06	181, 28 NW	288, 27 NE	TOP TO SW	22, 228			18°09'51"N; 67°01'03"W
382	ME	V. N OF DESCANSO 148SP06	240, 44 NW	274, 62 NE	TOP TO SW	15, 044			18°09'51"N; 67°01'03"W
383	ME	V. N OF DESCANSO 149SP06	350, 32 SW	333, 64 SW	TOP TO ENE	28, 228			18°09'52"N; 67°01'11"W
384	ME	V. N OF DESCANSO 149SP06	290, 52 NE	314, 78 NE	TOP TO NW	34, 079		CUTS SH383	18°09'52"N; 67°01'11"W
385	ME	V. N OF DESCANSO 149SP06	308, 80 SW	316, 70 SW	LL TOP TO SE	52, 142			18°09'52"N; 67°01'11"W
386	ME	V. N OF DESCANSO 149SP06	308, 43 SW	313, 72 SW	TOP TO NE	43, 231		CUTS SH385; BRECCIA	18°09'52"N; 67°01'11"W
387	ME	V. N OF DESCANSO 149SP06	312, 49 NE	280, 64 NE	RL TOP TO SE	15, 325			18°09'52"N; 67°01'11"W
388	ME	V. N OF DESCANSO 149SP06	190, 27 NW	189, 50 NW	TOP TO ENE	27, 277			18°09'52"N; 67°01'11"W
389	ME	V. N OF DESCANSO 149SP06	218, 33 NW	200, 54 NW	TOP TO E	26, 265			18°09'52"N; 67°01'11"W
390	ME	V. N OF DESCANSO 150SP06	252, 05 SE	240, 60 NW	TOP TO S	05, 151			18°09'53"N; 67°01'12"W
391	ME	V. N OF DESCANSO 150SP06	255, 08 NW	225, 45 NW	TOP TO SE	06, 309			18°09'53"N; 67°01'12"W

392	ME	V. N OF DESCANSO 151SP06	322, 58 SW	295, 71 SW	TOP TO NE	18, 154		18°09'52"N; 67°01'18"W
393	G	Rd 369 152SP06	355, 45 NE	318, 41 NE	TOP TO SE	16, 159		18°03'23"N; 66°56'59"W
394	G	Rd 369 152SP06	354, 27 NE	278, 40 NE	TOP TO SE	08, 157		18°03'23"N; 66°56'59"W
395	G	Rd 369 152SP06	188, 32 SE	290, 32 NE	TOP TO SE	18, 158		18°03'23"N; 66°56'59"W
396	G	Rd 369 152SP06	194, 41 SE	315, 50 NE	TOP TO S	07, 186		18°03'23"N; 66°56'59"W
397	G	Rd 369 152SP06	189, 78 SE	332, 69 NE	TOP TO S	19, 184		18°03'23"N; 66°56'59"W
398	G	Rd 369 152SP06	214, 61 SE	194, 48 SE	TOP TO S	37, 189		18°03'23"N; 66°56'59"W
399	G	Rd 369 152SP06	204, 66 SE	184, 48 SE	TOP TO S	46, 176		18°03'23"N; 66°56'59"W
400	G	Rd 369 152SP06	182, 32 SE	300, 38 NE	TOP TO S	09, 166		18°03'23"N; 66°56'59"W
401	G	Rd 369 152SP06	215, 21 SE	297, 10 NE	TOP TO S	19, 151		18°03'23"N; 66°56'59"W
402	G	Rd 369 152SP06	262, 24 SE	216, 41 NW	TOP TO SE	20, 136		18°03'23"N; 66°56'59"W
403	G	Rd 369 152SP06	208, 22 SE	274, 19 NE	TOP TO S	18, 152		18°03'23"N; 66°56'59"W
404	G	Rd 369 152SP06	312, 22 SW	230, 40 NW	TOP TO SE	11, 160		18°03'23"N; 66°56'59"W
405	ME	VEREDA DESCANSO 153SP06	262, 22 SE	315, 53 SW	TOP TO NE	07, 245		18°08'47"N; 67°01'13"W
406	ME	Rd 371 156SP06	280, 38 NE	336, 09 SW	TOP TO NE	37, 024		18°05'17"N; 66°53'24"W
407	ME	Rd 371 156SP06	286, 46 NE	285, 14 NE	TOP TO NE	46, 016		18°05'17"N; 66°53'24"W
408	ME	Rd 371 156SP06	275, 29 NE	193, 16 NW	TOP TO NE	24, 041		18°05'17"N; 66°53'24"W
409	ME	Rd 371 157SP06	282, 42 SW	PARALLEL	?			18°04'59"N; 66°53'15"W
410	ME	Rd 371 158SP06	345, 29 NE	342, 59 NE	TOP TO W	29, 070	MAP IT	18°04'57"N; 66°53'16"W
411	ME	Rd 371 158SP06	286, 57 NE	332, 86 NE	LL TOP TO NW	20, 092		18°04'57"N; 66°53'16"W
412	ME	Rd 371 158SP06	261, 23 NW	306, 62 NE	TOP TO SW	12, 051		18°04'57"N; 66°53'16"W
413	ME	Rd 371 158SP06	315, 19 NE	318, 80 NE	TOP TO SW	19, 048		18°04'57"N; 66°53'16"W
414	ME	Rd 371 159SP06	322, 77 NE	315, 71 NE	TOP TO SE	41, 130		18°04'55"N; 66°53'18"W
415	ME	Rd 371 159SP06	211, 26 NW	290, 62 NE	TOP TO SW	02, 214		18°04'55"N; 66°53'18"W
416	ME	Rd 371 159SP06	268, 23 SE	250, 26 NW	TOP TO S	23, 166		18°04'55"N; 66°53'18"W
417	ME	Rd 371 159SP06	301, 53 NE	318, 73 NE	TOP TO SW	37, 087		18°04'55"N; 66°53'18"W

418	ME	Rd 371 161SP06	287, 20 NE	295, 61 NE	TOP TO SW	20, 028			18°04'53"N; 66°53'17"W
419	ME	Rd 371 161SP06	270, 40 N	292, 80 NE	TOP TO S	33, 040			18°04'53"N; 66°53'17"W
420	ME	Rd 371 161SP06	160, 20 SW	295, 75 NE	TOP TO SW	14, 205			18°04'53"N; 66°53'17"W
421	ME	Rd 371 161SP06	268, 45 NW	PARALLEL	?				18°04'53"N; 66°53'17"W
422	ME	OFF Rd 371 162SP06	326, 40 NE	333, 75 NE	TOP TO SW	39, 071			18°04'57"N; 66°53'14"W
423	ME	OFF Rd 371 162SP06	165, 68 NE	131, 16 NE	TOP TO NE	66, 102		YOUNG???	18°04'57"N; 66°53'14"W
424	ME	OFF Rd 371 162SP06	346, 90	155, 41 NE	EAST DOWN	81, 166			18°04'57"N; 66°53'14"W
425	ME	OFF Rd 371 162SP06	268, 61 NW	322, 83 NE	TOP TO SW	11, 082			18°04'57"N; 66°53'14"W
426	ME	OFF Rd 371 162SP06	297, 37 NE	321, 71 NE	TOP TO SW	28, 072			18°04'57"N; 66°53'14"W
427	ME	OFF Rd 371 162SP06	310, 30 NE	322, 61 NE	TOP TO W	28, 063			18°04'56"N; 66°53'16"W
428	ME	Rd 371 163SP06	255, 45 SE	298, 78 SW	TOP TO NE	20, 235			18°04'37"N; 66°53'08"W
429	ME	Rd 371 163SP06	271, 72 SW	292, 83 NE	TOP TO NE	46, 252			18°04'37"N; 66°53'08"W
430	ME	OFF Rd 368 165SP06	190, 88 NW	225, 44 NW	TOP TO W	60, 194			18°02'57"N; 66°53'47"W
431	ME	OFF Rd 368 165SP06	347, 40 NE	191, 50 SE	TOP TO NW	14, 151			18°02'57"N; 66°53'47"W
432	ME	OFF Rd 368 165SP06	172, 10 NE	318, 37 NE	TOP TO NW	07, 038			18°02'57"N; 66°53'47"W
433	ME	OFF Rd 368 165SP06	155, 25 NE	337, 43 NE	TOP TO SW	25, 070			18°02'57"N; 66°53'47"W
434	ME	OFF Rd 368 165SP06	216, 60 SE	330, 31 NE	TOP TO SE	44, 182	60, 143		18°02'57"N; 66°53'47"W
435	ME	OFF Rd 368 165SP06	301, 38 SW	317, 56 SW	TOP TO NE	32, 246			18°02'57"N; 66°53'47"W
436	ME	OFF Rd 368 165SP06	307, 75 NE	328, 73 SW	TOP TO NW	54, 105			18°02'57"N; 66°53'47"W
437	ME	OFF Rd. 368 166SP06	215, 34 SE	213, 70 SE	TOP TO NW	34, 121			18°02'49"N; 66°53'23"W
438	ME	OFF Rd. 368 166SP06	211, 32 SE	206, 53 SE	TOP TO NW	31, 108			18°02'49"N; 66°53'23"W
439	ME	OFF Rd. 368 167SP06	322, 20 NE	324, 57 NE	TOP TO SW	20, 055			18°02'45"N; 66°53'17"W
440	ME	OFF Rd. 368 167SP06	315, 25 NE	350, 55 NE	TOP TO W	15, 099			18°02'45"N; 66°53'17"W
441	ME	OFF Rd. 368 167SP06	310, 06 NE	348, 34 NE	TOP TO	04, 084			18°02'45"N; 66°53'17"W

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442	ME	OFF Rd. 368 167SP06	327, 31 NE	356, 76 NE	TOP TO W	23, 099		18°02'45"N; 66°53'17"W
443	ME	OFF Rd. 368 167SP06	280, 76 NE	328, 70 NE	TOP TO NW	14, 284		18°02'45"N; 66°53'17"W
444	ME	OFF Rd. 368 167SP06	356, 46 NE	205, 89 NW	TOP TO NW	34, 134		18°02'45"N; 66°53'17"W
445	ME	OFF Rd. 368 167SP06	320, 37 NE	358, 60 NE	TOP TO NW	15, 120		18°02'45"N; 66°53'17"W
446	ME	OFF Rd. 368 167SP06	325, 17 NE	358, 49 NE	TOP TO NW	12, 102		18°02'45"N; 66°53'17"W
447	ME	OFF Rd. 368 168SP06	266, 45 NW	305, 71 NE	TOP TO SW	18, 066		18°03'24"N; 66°55'40"W
448	ME	OFF Rd. 368 168SP06	240, 40 NW	335, 69 NE	TOP TO W	11, 253		18°03'24"N; 66°55'40"W
449	ME	OFF Rd. 368 168SP06	254, 33 NW	302, 55 NE	TOP TO SW	07, 063		18°03'24"N; 66°55'40"W
450	ME	OFF Rd. 368 169SP06	300, 36 NE	304, 80 NE	TOP TO SW	35, 037		18°03'26"N; 66°55'39"W
451	ME	OFF Rd. 368 169SP06	241, 35 NW	301, 34 NE	TOP TO SW	15, 264		18°03'26"N; 66°55'39"W
452	ME	OFF Rd. 368 169SP06	275, 32 NE	294, 31 NE	TOP TO WSW	07, 287		18°03'26"N; 66°55'39"W
453	ME	OFF Rd. 368 169SP06	302, 72 NE	112, 15 NE	TOP TO NE	72, 042		18°03'26"N; 66°55'39"W
454	ME	OFF Rd. 368 169SP06	310, 08 NE	152, 77 NE	TOP TO SW	07, 063		18°03'26"N; 66°55'39"W
455	ME	OFF Rd. 368 169SP06	280, 36 NE	332, 79 NE	TOP TO SW	15, 079		18°03'26"N; 66°55'39"W
456	ME	OFF Rd. 368 169SP06	256, 15 NW	314, 74 NE	TOP TO SW	06, 050		18°03'26"N; 66°55'39"W
457	ME	OFF Rd. 368 170SP06	298, 35 NE	309, 80 NE	TOP TO SW	31, 050		18°03'29"N; 66°55'38"W
458	ME	OFF Rd. 368 170SP06	286, 48 NE	325, 79 NE	TOP TO SW	23, 085		18°03'29"N; 66°55'38"W
459	ME	OFF Rd. 368 170SP06	202, 45 SE	352, 80 NE	TOP TO SW	30, 057		18°03'29"N; 66°55'38"W
460	ME	OFF Rd. 368 170SP06	278, 17 NE	299, 48 NE	TOP TO SW	14, 039		18°03'29"N; 66°55'38"W
461	ME	OFF Rd. 368 170SP06	282, 33 NE	298, 86 NE	TOP TO SW	31, 036		18°03'29"N; 66°55'38"W
462	ME	OFF Rd. 368 170SP06	227, 24 NW	280, 70 NE	TOP TO SW	10, 022		18°03'29"N; 66°55'38"W
463	ME	OFF Rd. 368 171SP06	358, 20 SW	272, 22 NE	TOP TO SW	13, 218		18°03'23"N; 66°55'43"W

464	ME	OFF Rd. 368 171SP06	277, 16 NE	297, 45 NE	TOP TO SW	14, 037			18°03'23"N; 66°55'43"W
465	ME	OFF Rd. 368 171SP06	310, 15 NE	301, 38 NE	TOP TO SW	14, 025			18°03'23"N; 66°55'43"W
466	ME	OFF Rd. 368 171SP06	249, 83 NW	276, 81 NE	TOP TO SW	06, 250			18°03'23"N; 66°55'43"W
467	ME	OFF Rd. 368 171SP06	296, 30 NE	315, 52 NE	TOP TO SW	24, 067			18°03'23"N; 66°55'43"W
468	ME	OFF Rd. 361 172SP06	298, 77 NE	299, 81 SW	TOP TO SW	76, 041			18°08'28"N; 67°00'18"W
469	ME	OFF Rd. 361 172SP06	292, 77 NE	291, 73 NE	TOP TO SE	71, 069			18°08'28"N; 67°00'18"W
470	ME	OFF Rd. 361 172SP06	278, 81 SW	288, 67 SW	TOP TO SE	55, 111			18°08'28"N; 67°00'18"W
471	ME	OFF Rd. 361 172SP06	280, 45 SW	288, 75 SW	TOP TO NE	43, 211			18°08'28"N; 67°00'18"W
472	ME	OFF Rd. 361 172SP06	255, 40 NW	288, 78 NE	TOP TO SW	26, 040			18°08'28"N; 67°00'18"W
473	ME	OFF Rd. 361 172SP06	252, 63 NW	286, 89 SW	TOP TO S	31, 054			18°08'28"N; 67°00'18"W
474	ME	OFF Rd. 361 172SP06	287, 67 NE	290, 88 NE	TOP TO SW	66, 038			18°08'28"N; 67°00'18"W
475	ME	OFF Rd. 361 173SP06	304, 74 SW	285, 82 SW	TOP TO NW	20, 130	69, 222		18°08'17"N; 67°00'28"W
476	ME	OFF Rd. 361 173SP06	334, 44 SW	311, 61 SW	TOP TO N	23, 181			18°08'17"N; 67°00'28"W
477	ME	OFF Rd. 361 173SP06	350, 56 SW	318, 77 SW	TOP TO NE	23, 187			18°08'17"N; 67°00'28"W
478	ME	OFF Rd. 361 173SP06	294, 50 SW	284, 69 SW	TOP TO NE	43, 166			18°08'17"N; 67°00'28"W
479	ME	OFF Rd. 361 173SP06	312, 40 SW	280, 58 SW	TOP TO NE	15, 152			18°08'17"N; 67°00'28"W
480	ME	OFF Rd. 361 173SP06	308, 40 SW	297, 87 SW	TOP TO NE	39, 199			18°08'17"N; 67°00'28"W
481	ME	OFF Rd. 361 174SP06	310, 65 SW	304, 84 SW	TOP TO NE	60, 182			18°08'11"N; 67°00'33"W
482	ME	Rd. TO SUSUA OFF 368 175SP06	235, 46 NW	230, 82 SE	TOP TO SE	45, 316		BIG	18°04'29"N; 66°56'00"W
483	ME	Rd. TO SUSUA OFF 368 176SP06	179, 89 NE	225, 78 SE	TOP TO N	16, 359			18°04'29"N; 66°55'58"W
484	ME	Rd. TO SUSUA OFF 368 176SP06	120, 10 SW	348, 38 SW	TOP TO E	05, 270			18°04'29"N; 66°55'58"W
485	ME	Rd. TO SUSUA OFF 368 176SP06	325, 53 SW	186, 63 NW	TOP TO SE	03, 323			18°04'29"N; 66°55'58"W
486	ME	Rd. TO SUSUA OFF 368 176SP06	351, 71 NE	327, 68 NE	TOP TO S	11, 167			18°04'29"N; 66°55'58"W

487	ME	Rd. TO SUSUA OFF 368 176SP06	330, 89 NE	320, 69 SW	TOP TO S	67, 333	1.5 M THICK	18°04'29"N; 66°55'58"W
488	ME	Rd. TO SUSUA OFF 368 177SP06	321, 90	345, 66 NE	SW SIDE TO SE	48, 321		18°04'29"N; 66°55'50"W
489	ME	Rd. TO SUSUA OFF 368 177SP06	295, 50 SW	190, 53 NW	TOP TO SE	17, 130		18°04'29"N; 66°55'50"W
490	ME	Rd. TO SUSUA OFF 368 177SP06	307, 86 SW	330, 72 NE	TOP TO SE	45, 303		18°04'29"N; 66°55'50"W
491	ME	Rd. TO SUSUA OFF 368 177SP06	337, 60 NE	325, 83 SW	TOP TO SW	55, 032		18°04'29"N; 66°55'50"W
492	ME	Rd. TO SUSUA OFF 368 177SP06	262, 77 NW	302, 43 NE	TOP TO W	52, 280		18°04'29"N; 66°55'50"W
493	ME	Rd. TO SUSUA OFF 368 177SP06	328, 84 SW	287, 77 SW	TOP TO N	13, 327		18°04'29"N; 66°55'50"W
494	ME	Rd. TO SUSUA OFF 368 177SP06	344, 60 NE	314, 87 NE	TOP TO SW	32, 005	MAP IT	18°04'29"N; 66°55'50"W
495	ME	Rd. TO SUSUA OFF 368 177SP06	342, 44 NE	302, 72 NE	TOP TO S	19, 002		18°04'29"N; 66°55'50"W
496	ME	Rd. TO SUSUA OFF 368 177SP06	190, 21 SE	331, 40 SE	TOP TO S	18, 070		18°04'29"N; 66°55'50"W
497	ME	Rd. TO SUSUA OFF 368 178SP06	230, 55 NW	213, 35 NW	TOP TO N	48, 359		18°04'31"N; 66°55'46"W
498	ME	Rd. TO SUSUA OFF 368 178SP06	238, 59 SE	254, 53 SE	TOP TO E	24, 074		18°04'31"N; 66°55'46"W
499	ME	Rd. TO SUSUA OFF 368 178SP06	235, 10 NW	260, 39 NW	TOP TO S	08, 358	CUTS SH498?	18°04'31"N; 66°55'46"W
500	ME	Rd. TO SUSUA OFF 368 178SP06	196, 32 NW	227, 46 NW	TOP TO SE	11, 356		18°04'31"N; 66°55'46"W
501	ME	Rd. TO SUSUA OFF 368 178SP06	229, 50 NW	179, 14 SW	TOP TO N	49, 301		18°04'31"N; 66°55'46"W
502	ME	Rd. TO SUSUA OFF 368 178SP06	180, 17 W	248, 53 NW	TOP TO SE	03, 352		18°04'31"N; 66°55'46"W
503	ME	Rd. TO SUSUA OFF 368 178SP06	190, 76 NW	191, 57 NW	TOP TO W	76, 271		18°04'31"N; 66°55'46"W
504	ME	Rd. TO SUSUA OFF 368 178SP06	224, 32 NW	014, 20 NW	TOP TO NW	26, 353		18°04'31"N; 66°55'46"W
505	ME	Rd. TO SUSUA OFF 368 178SP06	213, 65 NW	215, 37 NW	TOP TO NW	65, 298		18°04'31"N; 66°55'46"W
506	ME	Rd. TO SUSUA OFF 368 179SP06	185, 25 NW	224, 54 NW	TOP TO S	13, 335		18°04'28"N; 66°55'45"W
507	ME	Rd. TO SUSUA OFF 368 179SP06	331, 12 SW	236, 52 NW	TOP TO SW	01, 156		18°04'28"N; 66°55'45"W
508	ME	Rd. TO SUSUA OFF 368 179SP06	354, 31 SW	210, 62 NW	TOP TO SE	18, 323		18°04'28"N; 66°55'45"W
509	ME	Rd. TO SUSUA OFF 368 179SP06	338, 10 SW	230, 32 NW	TOP TO SE	00, 336	MAP IT	18°04'28"N; 66°55'45"W

510	ME	Rd. TO SUSUA OFF 368 179SP06	203, 14 NW	239, 42 NW	TOP TO S	09, 343			18°04'28"N; 66°55'45"W
511	ME	Rd. TO SUSUA OFF 368 179SP06	232, 08 NW	219, 63 NW	TOP TO S	08, 308			18°04'28"N; 66°55'45"W
512	ME	Rd. TO SUSUA OFF 368 179SP06	220, 10 NW	246, 73 NW	TOP TO S	09, 338			18°04'28"N; 66°55'45"W
513	ME	Rd. TO SUSUA OFF 368 179SP06	300, 22 SW	230, 53 NW	TOP TO SW	12, 151			18°04'28"N; 66°55'45"W
514	ME	Rd. TO SUSUA OFF 368 179SP06	320, 15 SW	207, 30 NW	TOP TO SW	01, 145			18°04'28"N; 66°55'45"W
515	ME	Rd. TO SUSUA OFF 368 180SP06	252, 52 NW	232, 20 NW	TOP TO N	50, 002		YOUNG	18°04'24"N; 66°55'41"W
516	ME	Rd. TO SUSUA OFF 368 180SP06	275, 25 NE	270, 68 N	TOP TO S	25, 358			18°04'24"N; 66°55'41"W
517	ME	Rd. TO SUSUA OFF 368 180SP06	258, 69 NW	227, 28 NW	TOP TO N	62, 032			18°04'24"N; 66°55'41"W
518	ME	Rd. TO SUSUA OFF 368 180SP06	268, 68 NW	265, 42 NW	TOP TO N	67, 010			18°04'24"N; 66°55'41"W
519	ME	Rd. TO SUSUA OFF 368 181SP06	300, 74 NE	318, 32 NE	TOP TO NE	69, 348		BIG	18°04'23"N; 66°55'39"W
520	ME	Rd. TO SUSUA OFF 368 181SP06	299, 32 NE	PARALLEL	N		26, 344	BIG; 2 M THICK	18°04'23"N; 66°55'39"W
521	ME	Rd. TO SUSUA OFF 368 181SP06	240, 02 NW	237, 32 NW	TOP TO S	02, 327		SMALL	18°04'23"N; 66°55'39"W
522	ME	Rd. TO SUSUA OFF 368 182SP06	337, 22 SW	178, 65 SW	TOP TO SE	19, 277			18°04'24"N; 66°55'37"W
523	ME	Rd. TO SUSUA OFF 368 182SP06	311, 84 NE	329, 33 NE	TOP TO NE	76, 338	30, 320		18°04'24"N; 66°55'37"W
524	ME	Rd. TO SUSUA OFF 368 182SP06	210, 36 NW	211, 12 NW	TOP TO NW	36, 300		1 M THICK	18°04'24"N; 66°55'37"W
525	ME	Rd. TO SUSUA OFF 368 182SP06	202, 44 NW	203, 67 NW	TOP TO SE	44, 296			18°04'24"N; 66°55'37"W
526	ME	Rd. TO SUSUA OFF 368 183SP06	201, 22 NW	216, 50 NW	TOP TO SE	20, 316			18°04'22"N; 66°55'34"W
527	ME	Rd. TO SUSUA OFF 368 183SP06	236, 20 NW	250, 41 NW	TOP TO S	18, 353			18°04'22"N; 66°55'34"W
528	ME	Rd. TO SUSUA OFF 368 183SP06	205, 07 NW	240, 30 NW	TOP TO S	05, 338			18°04'22"N; 66°55'34"W
529	ME	Rd. TO SUSUA OFF 368 185SP06	327, 38 SW	328, 85 SW	TOP TO NE	38, 239			18°04'19"N; 66°55'25"W
530	ME	Rd. TO SUSUA OFF 368 185SP06	084, 08 SE	356, 54 NE	TOP TO SW	01, 260			18°04'19"N; 66°55'25"W
531	ME	Rd. TO SUSUA OFF 368 185SP06	301, 08 SW	284, 34 NE	TOP TO S	08, 197			18°04'19"N; 66°55'25"W
532	ME	Rd. TO SUSUA OFF 368 185SP06	318, 39 NE	248, 32 SE	TOP TO NE	30, 004			18°04'19"N; 66°55'25"W

533	ME	Rd. TO SUSUA OFF 368 185SP06	255, 10 SE	334, 47 NE	TOP TO SW	03, 235			18°04'19"N; 66°55'25"W
534	ME	Rd. TO SUSUA OFF 368 187SP06	210, 29 SE	196, 52 SE	TOP TO W	25, 090		4 M THICK	18°04'20"N; 66°55'19"W
535	ME	Rd. TO SUSUA OFF 368 187SP06	190, 42 SE	193, 66 SE	TOP TO W	41, 109			18°04'20"N; 66°55'19"W
536	ME	Rd. TO SUSUA OFF 368 187SP06	350, 15 NE	192, 51 SE	TOP TO W	13, 110			18°04'20"N; 66°55'19"W
537	ME	Rd. TO SUSUA OFF 368 188SP06	215, 15 SE	180, 40 E	TOP TO W	10, 074			18°04'20"N; 66°55'14"W
538	ME	Rd. TO SUSUA OFF 368 188SP06	207, 32 SE	188, 63 SE	TOP TO W	27, 082			18°04'20"N; 66°55'14"W
539	ME	Rd. TO SUSUA OFF 368 188SP06	176, 72 NE	175, 88 NE	TOP TO W	72, 076			18°04'20"N; 66°55'14"W
540	ME	Rd. TO SUSUA OFF 368 188SP06	199, 28 SE	193, 78 SE	TOP TO W	27, 100			18°04'20"N; 66°55'14"W
541	ME	Rd. TO SUSUA OFF 368 188SP06	191, 56 SE	315, 10 SW	TOP TO E	55, 085			18°04'20"N; 66°55'14"W
542	ME	Rd. TO SUSUA OFF 368 188SP06	230, 35 SE	180, 72 E	TOP TO W	13, 070		CUTS SH540	18°04'20"N; 66°55'14"W
543	ME	Rd. TO SUSUA OFF 368 188SP06	203, 33 SE	190, 67 SE	TOP TO W	31, 088			18°04'20"N; 66°55'14"W
544	ME	Rd. TO SUSUA OFF 368 191SP06	269, 05 SE	236, 48 SE	TOP TO NW	04, 143			18°04'13"N; 66°54'53"W
545	ME	Rd. TO SUSUA OFF 368 191SP06	214, 70 NW	188, 83 NW	TOP TO E	23, 222		CUTS SH546?	18°04'13"N; 66°54'53"W
546	ME	Rd. TO SUSUA OFF 368 191SP06	325, 66 NE	301, 52 NE	RL TOP TO SE	36, 126			18°04'13"N; 66°54'53"W
547	ME	Rd. TO SUSUA OFF 368 192SP06	320, 12 NE	231, 38 NW	TOP TO SE	03, 127			18°04'11"N; 66°54'50"W
548	ME	Rd. TO SUSUA OFF 368 192SP06	354, 05 NE	336, 43 NE	TOP TO W	04, 064			18°04'11"N; 66°54'50"W
549	ME	Rd. TO SUSUA OFF 368 193SP06	357, 05 NE	215, 23 NW	TOP TO SE	05, 119			18°04'10"N; 66°54'49"W
550	ME	Rd. TO SUSUA OFF 368 193SP06	197, 14 SE	317, 23 NE	TOP TO SW	01, 191			18°04'10"N; 66°54'49"W
551	ME	Rd. TO SUSUA OFF 368 194SP06	223, 08 SE	232, 43 NW	TOP TO SE	08, 141			18°04'07"N; 66°54'48"W
552	ME	Rd. TO SUSUA OFF 368 195SP06	225, 65 SE	282, 77 SW	TOP TO NE	01, 224			18°04'05"N; 66°54'45"W
553	ME	Rd. TO SUSUA OFF 368 197SP06	245, 19 NW	276, 56 NE	TOP TO S	14, 017			18°04'03"N; 66°54'43"W
554	ME	Rd. TO SUSUA OFF 368 197SP06	243, 35 NW	182, 10 NW	TOP TO N	34, 354			18°04'03"N; 66°54'43"W
555	ME	Rd. TO SUSUA OFF 368 197SP06	280, 37 SW	248, 30 NW	TOP TO S	35, 169			18°04'03"N; 66°54'43"W

556	ME	Rd. TO SUSUA OFF 368 197SP06	314, 45 SW	290, 04 SW	TOP TO S	45, 228			18°04'03"N; 66°54'43"W
557	ME	Rd. TO SUSUA OFF 368 197SP06	315, 10 SW	271, 30 NE	TOP TO S	08, 190			18°04'03"N; 66°54'43"W
558	ME	Rd. TO SUSUA OFF 368 197SP06	292, 48 SW	320, 16 SW	TOP TO SW	46, 182			18°04'03"N; 66°54'43"W
559	ME	Rd. TO SUSUA OFF 368 198SP06	296, 20 NE	311, 44 NE	TOP TO SW	18, 053			18°04'07"N; 66°54'41"W
560	ME	Rd. TO SUSUA OFF 368 198SP06	299, 35 NE	153, 50 NE	TOP TO SW	11, 103	35, 011		18°04'07"N; 66°54'41"W
561	ME	Rd. TO SUSUA OFF 368 198SP06	280, 20 NE	296, 42 NE	TOP TO SW	18, 039	20, 052		18°04'07"N; 66°54'41"W
562	ME	Rd. TO SUSUA OFF 368 198SP06	282, 03 SW	287, 35 NE	TOP TO SW	03, 197			18°04'07"N; 66°54'41"W
563	ME	Rd. TO SUSUA OFF 368 198SP06	237, 36 SE	228, 27 NW	TOP TO SE	36, 141			18°04'07"N; 66°54'41"W
564	ME	Rd. TO SUSUA OFF 368 198SP06	312, 19 SW	268, 55 SE	TOP TO NW	10, 164			18°04'07"N; 66°54'41"W
565	ME	Rd. TO SUSUA OFF 368 198SP06	205, 44 NW	290, 37 SW	TOP TO NW	29, 350	22, 003	CUTS SH564	18°04'07"N; 66°54'41"W
566	ME	Rd. TO SUSUA OFF 368 199SP06	288, 07 NE	175, 19 SW	TOP TO E	04, 069			18°04'08"N; 66°54'41"W
567	ME	Rd. TO SUSUA OFF 368 199SP06	325, 64 NE	110, 15 NE	TOP TO NE	62, 079			18°04'08"N; 66°54'41"W
568	ME	Rd. TO SUSUA OFF 368 199SP06	149, 26 NE	197, 15 NW	TOP TO E	24, 080			18°04'08"N; 66°54'41"W
569	ME	Rd. TO SUSUA OFF 368 200SP06	321, 50 SW	304, 89 NE	TOP TO N	44, 195			18°04'10"N; 66°54'38"W
570	ME	Rd. TO SUSUA OFF 368 200SP06	056, 11 NW	311, 56 NE	TOP TO SW	02, 048			18°04'10"N; 66°54'38"W
571	ME	Rd. TO SUSUA OFF 368 200SP06	270, 16 N	330, 20 NE	TOP TO SW	05, 287			18°04'10"N; 66°54'38"W
572	ME	Rd. TO SUSUA OFF 368 200SP06	293, 16 NE	315, 40 NE	TOP TO SW	13, 058			18°04'10"N; 66°54'38"W
573	ME	Rd. TO SUSUA OFF 368 200SP06	301, 12 SW	301, 46 NE	TOP TO SW	12, 211			18°04'10"N; 66°54'38"W
574	ME	Rd. TO SUSUA OFF 368 200SP06	318, 29 SW	269, 50 NW	TOP TO SW	23, 187			18°04'10"N; 66°54'38"W
575	ME	Rd. TO SUSUA OFF 368 201SP06	262, 42 NW	282, 64 NE	TOP TO SW	30, 043		Reactivated AS N; CUTS F537	18°04'12"N; 66°54'38"W
576	ME	Rd. TO SUSUA OFF 368 201SP06	250, 40 SE	280, 15 SW	TOP TO SE	38, 140	15, 112	CUTS F542	18°04'12"N; 66°54'38"W
577	ME	Rd. TO SUSUA OFF 368 201SP06	271, 65 NE	286, 85 NE	TOP TO SW	46, 063			18°04'12"N; 66°54'38"W

578	ME	Rd. TO SUSUA OFF 368 201SP06	272, 38 NE	255, 06 NW	TOP TO NE	38, 007			18°04'12"N; 66°54'38"W
579	ME	Rd. TO SUSUA OFF 368 202SP06	280, 37 SW	280, 69 SW	TOP TO NE	37, 190			18°04'15"N; 66°54'39"W
580	ME	Rd. TO SUSUA OFF 368 202SP06	260, 10 NW	276, 27 SW	TOP TO N	10, 002			18°04'15"N; 66°54'39"W
581	ME	Rd. TO SUSUA OFF 368 202SP06	288, 43 NE	220, 13 NW	TOP TO N	40, 043		CUTS SH582	18°04'15"N; 66°54'39"W
582	ME	Rd. TO SUSUA OFF 368 202SP06	278, 20 NE	290, 49 NE	TOP TO SW	19, 027			18°04'15"N; 66°54'39"W
583	ME	Rd. TO SUSUA OFF 368 202SP06	242, 06 NW	271, 33 NE	TOP TO SW	05, 006			18°04'15"N; 66°54'39"W
584	ME	Rd. TO SUSUA OFF 368 202SP06	271, 53 NE	256, 18 NW	TOP TO N	52, 014		CUTS SH585	18°04'15"N; 66°54'39"W
585	ME	Rd. TO SUSUA OFF 368 202SP06	294, 14 SW	271, 23 NE	TOP TO SW	13, 188			18°04'15"N; 66°54'39"W
586	ME	Rd. TO SUSUA OFF 368 202SP06	301, 07 NE	296, 75 NE	TOP TO SW	07, 026			18°04'15"N; 66°54'39"W
587	ME	Rd. TO SUSUA OFF 368 202SP06	298, 13 NE	288, 67 NE	TOP TO SW	12, 016			18°04'15"N; 66°54'39"W
588	ME	Rd. TO SUSUA OFF 368 202SP06	268, 07 NW	114, 59 NE	TOP TO SW	06, 026			18°04'15"N; 66°54'39"W
589	ME	Rd. TO SUSUA OFF 368 202SP06	278, 23 SW	115, 67 NE	TOP TO SW	22, 204	23, 166		18°04'15"N; 66°54'39"W
590	ME	Rd. TO SUSUA OFF 368 202SP06	294, 37 SW	273, 49 SW	TOP TO N	18, 141			18°04'15"N; 66°54'39"W
591	ME	Rd. TO SUSUA OFF 368 202SP06	110, 13 NE	130, 55 NE	TOP TO SW	11, 045			18°04'15"N; 66°54'39"W
592	ME	Rd. TO SUSUA OFF 368 203SP06	295, 35 NE	218, 10 SE	TOP TO NE	33, 006			18°04'16"N; 66°54'38"W
593	ME	Rd. TO SUSUA OFF 368 203SP06	289, 64 NE	286, 38 NE	TOP TO NE	64, 029			18°04'16"N; 66°54'38"W
594	ME	Rd. TO SUSUA OFF 368 203SP06	316, 12 NE	288, 63 NE	TOP TO SW	10, 014			18°04'16"N; 66°54'38"W
595	ME	Rd. TO SUSUA OFF 368 203SP06	301, 11 NE	282, 36 NE	TOP TO S	10, 004			18°04'16"N; 66°54'38"W
596	ME	Rd. TO SUSUA OFF 368 203SP06	279, 60 NE	272, 23 NE	TOP TO N	60, 018			18°04'16"N; 66°54'38"W
597	ME	Rd. TO SUSUA OFF 368 203SP06	238, 21 NW	199, 28 SE	TOP TO NW	20, 302			18°04'16"N; 66°54'38"W
598	ME	Rd. TO SUSUA OFF 368 203SP06	212, 14 SE	222, 37 SE	TOP TO N	14, 138			18°04'16"N; 66°54'38"W
599	ME	Rd. TO SUSUA OFF 368 203SP06	185, 20 SE	248, 37 SE	TOP TO NE	01, 007			18°04'16"N; 66°54'38"W
600	ME	Rd. TO SUSUA OFF 368 204SP06	209, 15 NW	340, 24 NE	TOP TO NW	13, 266			18°04'13"N; 66°54'36"W

601	ME	Rd. TO SUSUA OFF 368 204SP06	185, 08 SE	235, 40 SE	TOP TO NW	04, 154			18°04'13"N; 66°54'36"W
602	ME	Rd. TO SUSUA OFF 368 204SP06	250, 25 NW	226, 48 SE	TOP TO NW	23, 320			18°04'13"N; 66°54'36"W
603	ME	Rd. TO SUSUA OFF 368 205SP06	245, 10 SE	310, 69 NE	TOP TO SW	05, 218			18°04'13"N; 66°54'33"W
604	ME	Rd. TO SUSUA OFF 368 205SP06	190, 20 SE	325, 58 NE	TOP TO SW	10, 041		CUTS SH605???	18°04'13"N; 66°54'33"W
605	ME	Rd. TO SUSUA OFF 368 205SP06	348, 25 NE	351, 46 SW	TOP TO E	25, 080			18°04'13"N; 66°54'33"W
606	ME	Rd. TO SUSUA OFF 368 205SP06	250, 08 NW	324, 35 SW	TOP TO NE	03, 044			18°04'13"N; 66°54'33"W
607	ME	Rd. TO SUSUA OFF 368 205SP06	265, 11 NW	290, 23 SW	TOP TO N	10, 013			18°04'13"N; 66°54'33"W
608	ME	Rd. TO SUSUA OFF 368 205SP06	274, 45 NE	250, 08 SE	TOP TO N	45, 358			18°04'13"N; 66°54'33"W
609	ME	Rd. TO SUSUA OFF 368 205SP06	248, 39 NW	241, 15 SE	TOP TO N	39, 335			18°04'13"N; 66°54'33"W
610	ME	Rd. TO SUSUA OFF 368 206SP06	246, 23 NW	192, 22 NW	TOP TO N	10, 040			18°04'15"N; 66°54'33"W
611	ME	Rd. TO SUSUA OFF 368 206SP06	252, 16 NW	284, 23 SW	TOP TO NE	15, 002			18°04'15"N; 66°54'33"W
612	ME	Rd. TO SUSUA OFF 368 206SP06	233, 20 NW	293, 63 NE	TOP TO SW	06, 035			18°04'15"N; 66°54'33"W
613	ME	Rd. TO SUSUA OFF 368 206SP06	267, 36 NW	242, 05 NW	TOP TO N	36, 001			18°04'15"N; 66°54'33"W
614	ME	Rd. TO SUSUA OFF 368 206SP06	215, 12 NW	276, 08 SW	TOP TO N	11, 330			18°04'15"N; 66°54'33"W
615	ME	Rd. TO SUSUA OFF 368 206SP06	324, 31 SW	PARALLEL	?				18°04'15"N; 66°54'33"W
616	ME	Rd. TO SUSUA OFF 368 208SP06	158, 32 SW	232, 08 NW	TOP TO SW	31, 230			18°04'20"N; 66°54'31"W
617	ME	Rd. TO SUSUA OFF 368 208SP06	342, 37 SW	082, 18 NW	TOP TO SW	33, 220			18°04'20"N; 66°54'31"W
618	ME	Rd. TO SUSUA OFF 368 208SP06	248, 20 NW	264, 23 SE	TOP TO N	19, 348			18°04'20"N; 66°54'31"W
619	ME	Rd. TO SUSUA OFF 368 208SP06	348, 06 NE	295, 52 NE	TOP TO SW	03, 021			18°04'20"N; 66°54'31"W
620	ME	Rd. TO SUSUA OFF 368 210SP06	302, 25 NE	345, 09 SW		24, 045	24, 047; N		18°04'17"N; 66°54'31"W
							11, 111; TOP TO NW	YOUNG	
621	ME	Rd. TO SUSUA OFF 368 211SP06	194, 50 NW	182, 38 NW	TOP TO NW	41, 327			18°04'06"N; 66°54'21"W

622	ME	Rd. TO SUSUA OFF 368 211SP06	201, 36 NW	322, 20 SW	TOP TO NW	29, 332			18°04'06"N; 66°54'21"W
623	ME	Rd. TO SUSUA OFF 368 211SP06	225, 13 NW	190, 20 NW	TOP TO NW	04, 242			18°04'06"N; 66°54'21"W
624	ME	Rd. TO SUSUA OFF 368 211SP06	217, 30 NW	355, 13 SW	TOP TO NW	27, 334		CUTS SH625	18°04'06"N; 66°54'21"W
625	ME	Rd. TO SUSUA OFF 368 211SP06	295, 61 SW	261, 68 SE	TOP TO NW	04, 118			18°04'06"N; 66°54'21"W
626	ME	Rd. TO SUSUA OFF 368 212SP06	318, 10 SW	234, 37 SE	TOP TO NW	01, 311			18°03'57"N; 66°54'13"W
627	ME	Rd. TO SUSUA OFF 368 212SP06	355, 10 SW	235, 10 SE	TOP TO NW	09, 296			18°03'57"N; 66°54'13"W
628	ME	Rd. TO SUSUA OFF 368 212SP06	336, 79 SW	192, 87 SE	TOP TO S	19, 332			18°03'57"N; 66°54'13"W
629	ME	Rd. TO SUSUA OFF 368 212SP06	191, 05 NW	225, 37 SE	TOP TO NW	05, 312			18°03'57"N; 66°54'13"W
630	ME	Rd. TO SUSUA OFF 368 212SP06	204, 24 NW	247, 48 NW	TOP TO S	10, 002			18°03'57"N; 66°54'13"W
631	ME	Rd. TO SUSUA OFF 368 212SP06	270, 28 S	202, 33 NW	TOP TO S	21, 135			18°03'57"N; 66°54'13"W
632	ME	Rd. TO SUSUA OFF 368 213SP06	277, 88 NE	273, 74 NE	TOP TO S	75, 088		BENDS TO 290, 42 NE	18°03'57"N; 66°54'03"W
633	ME	Rd. TO SUSUA OFF 368 213SP06	267, 70 NW	PARALLEL	?				18°03'57"N; 66°54'03"W
634	ME	Rd. TO SUSUA OFF 368 213SP06	305, 30 NE	275, 70 NE	TOP TO S	22, 350			18°03'57"N; 66°54'03"W
635	ME	Rd. TO SUSUA OFF 368 213SP06	254, 28 NW	264, 70 NW	TOP TO S	28, 360			18°03'57"N; 66°54'03"W
636	ME	Rd. TO SUSUA OFF 368 214SP06	199, 47 SE	314, 42 NE	TOP TO SW	21, 177		CUTS F573	18°03'55"N; 66°53'55"W
637	ME	Rd. TO SUSUA OFF 368 215SP06	310, 15 SW	200, 60 NW	TOP TO SE	03, 300			18°03'58"N; 66°53'49"W
638	ME	Rd. TO SUSUA OFF 368 215SP06	281, 30 SW	196, 58 NW	TOP TO SE	10, 120			18°03'58"N; 66°53'49"W
639	ME	Rd. TO SUSUA OFF 368 215SP06	330, 08 SW	206, 49 NW	TOP TO SE	04, 302			18°03'58"N; 66°53'49"W
640	ME	Rd. TO SUSUA OFF 368 215SP06	200, 08 NW	205, 44 NW	TOP TO SE	08, 296			18°03'58"N; 66°53'49"W
641	ME	Rd. TO SUSUA OFF 368 215SP06	348, 70 SW	335, 64 SW	TOP TO W	27, 337			18°03'58"N; 66°53'49"W
642	ME	Rd. TO SUSUA OFF 368 215SP06	335, 14 SW	180, 32 W	TOP TO SE	10, 287			18°03'58"N; 66°53'49"W
643	ME	Rd. TO SUSUA OFF 368 216SP06	212, 12 NW	280, 30 SW	TOP TO N	07, 354			18°03'48"N; 66°53'49"W
644	ME	Rd. TO SUSUA OFF 368 216SP06	305, 12 SW	195, 23 SE	TOP TO NW	08, 264			18°03'48"N; 66°53'49"W

645	ME	Rd. TO SUSUA OFF 368 216SP06	230, 21 SE	297, 22 SW	TOP TO SE	10, 078			18°03'48"N; 66°53'49"W
646	ME	Rd. TO SUSUA OFF 368 216SP06	224, 12 SE	210, 20 NW	TOP TO SE	12, 128			18°03'48"N; 66°53'49"W
647	ME	Rd. TO SUSUA OFF 368 216SP06	278, 20 NE	094, 56 NE	TOP TO S	20, 002			18°03'48"N; 66°53'49"W
648	ME	Rd. TO SUSUA OFF 368 216SP06	327, 75 SW	284, 87 SW	TOP TO NW	11, 150		CUTS SH647	18°03'48"N; 66°53'49"W
649	ME	Rd. TO SUSUA OFF 368 216SP06	255, 34 NW	267, 17 SE	TOP TO N	34, 351			18°03'48"N; 66°53'49"W
650	ME	Rd. TO SUSUA OFF 368 216SP06	258, 55 NW	219, 10 NW	TOP TO N	54, 003		BIG; YOUNG?; CUTS SH651??	18°03'48"N; 66°53'49"W
651	ME	Rd. TO SUSUA OFF 368 216SP06	328, 07 SW	207, 40 NW	TOP TO SE	02, 305			18°03'48"N; 66°53'49"W
652	ME	Rd. TO SUSUA OFF 368 216SP06	322, 57 NE	182, 74 SE	TOP TO N	13, 133			18°03'48"N; 66°53'49"W
653	ME	Rd. TO SUSUA OFF 368 216SP06	195, 53 SE	242, 45 SE	TOP TO SE	22, 032		BIG	18°03'48"N; 66°53'49"W
654	ME	Rd. TO SUSUA OFF 368 216SP06	344, 57 NE	339, 45 NE	TOP TO NE	54, 103			18°03'48"N; 66°53'49"W
655	ME	Rd. TO SUSUA OFF 368 216SP06	220, 30 SE	180, 13 W	TOP TO SE	29, 116			18°03'48"N; 66°53'49"W
656	ME	Rd. TO SUSUA OFF 368 217SP06	112, 05 SW	346, 43 SW	TOP TO E	02, 261			18°03'36"N; 66°53'39"W
657	ME	TRAIL RIO LOCO 219SP06	350, 08 NE	245, 28 NW	TOP TO SE	04, 142			18°03'31"N; 66°53'23"W
658	ME	TRAIL RIO LOCO 219SP06	193, 16 SE	285, 20 NE	TOP TO SE	09, 158			18°03'31"N; 66°53'23"W
659	ME	TRAIL RIO LOCO 219SP06	350, 08 NE	251, 27 NW	TOP TO SE	03, 146			18°03'31"N; 66°53'23"W
660	ME	TRAIL RIO LOCO 219SP06	175, 15 NE	200, 43 SE	TOP TO NW	13, 121			18°03'31"N; 66°53'23"W
661	ME	TRAIL RIO LOCO 219SP06	232, 02 NW	242, 18 NW	TOP TO SE	02, 333			18°03'31"N; 66°53'23"W
662	ME	TRAIL RIO LOCO 220SP06	177, 06 NE	193, 23 SE	TOP TO NW	05, 108			18°03'35"N; 66°53'28"W
663	ME	TRAIL RIO LOCO 220SP06	345, 00	232, 32 NW	TOP TO SE	00, 322			18°03'35"N; 66°53'28"W
664	ME	TRAIL RIO LOCO 220SP06	273, 32 NE	331, 70 NE	TOP TO SW	09, 078			18°03'35"N; 66°53'30"W
665	ME	TRAIL N OF SUSUA 223SP06	211, 60 NW	185, 62 NW	TOP TO NE	01, 030			18°04'19"N; 66°54'22"W
666	ME	TRAIL N OF SUSUA 223SP06	187, 20 NW		?				18°04'19"N; 66°54'22"W

667	ME	TRAIL N OF SUSUA 223SP06	310, 10 NE	324, 46 NE	TOP TO SW	10, 058		1.5 M THICK OVER MASS. SERP.	18°04'19"N; 66°54'22"W
668	ME	TRAIL N OF SUSUA 223SP06	346, 02 SW	334, 48 NE	TOP TO SW	02, 244		BRECCIA	18°04'19"N; 66°54'22"W
669	ME	TRAIL N OF SUSUA 223SP06	308, 38 NE	207, 13 SE	TOP TO NE	35, 012		Y. THAN SH 667 AND SH 668	18°04'19"N; 66°54'22"W
670	ME	TRAIL N OF SUSUA 224SP06	330, 32 NE	196, 31 SE	TOP TO N	12, 349			18°04'26"N; 66°54'20"W
671	ME	TRAIL N OF SUSUA 224SP06	266, 56 NW	291, 41 NE	TOP TO N	37, 296			18°04'26"N; 66°54'20"W
672	ME	TRAIL N OF SUSUA 224SP06	281, 18 NE	275, 48 NE	TOP TO SW	17, 002			18°04'26"N; 66°54'20"W
673	ME	TRAIL N OF SUSUA 224SP06	200, 28 SE	236, 47 NW	TOP TO SE	25, 140			18°04'26"N; 66°54'20"W
674	ME	TRAIL N OF SUSUA 224SP06	229, 22 NW	298, 28 NE	TOP TO SW	08, 249	04, 037		18°04'26"N; 66°54'20"W
675	ME	TRAIL N OF SUSUA 225SP06	313, 53 NE	085, 75 NW	TOP TO S?	11, 322	01, 306		18°04'27"N; 66°54'24"W
676	ME	TRAIL N OF SUSUA 226SP06	338, 64 NE	348, 33 NE	TOP TO N?	63, 045			18°04'32"N; 66°54'22"W
677	ME	TRAIL N OF SUSUA 228SP06	177, 07 NE	315, 32 NE	TOP TO W	05, 036			18°05'04"N; 66°54'31"W
678	ME	TRAIL N OF SUSUA 228SP06	327, 23 NE	169, 55 NE	TOP TO W	19, 092			18°05'04"N; 66°54'31"W
679	ME	TRAIL N OF SUSUA 228SP06	160, 10 NE	170, 34 NE	TOP TO W	09, 083			18°05'04"N; 66°54'31"W
680	ME	TRAIL N OF SUSUA 228SP06	326, 13 NE	152, 42 NE	TOP TO W	13, 064			18°05'04"N; 66°54'31"W
681	ME	TRAIL N OF SUSUA 228SP06	220, 13 SE	195, 40 SE	TOP TO NW	11, 095			18°05'04"N; 66°54'31"W
682	ME	TRAIL N OF SUSUA 229SP06	142, 08 NE	175, 41 NE	TOP TO W	06, 092			18°04'59"N; 66°54'30"W
683	ME	TRAIL N OF SUSUA 229SP06	328, 42 NE	325, 86 NE	TOP TO SW	42, 052			18°04'59"N; 66°54'30"W
684	ME	TRAIL N OF SUSUA 229SP06	288, 10 SW	315, 47 NE	TOP TO SW	09, 222			18°04'59"N; 66°54'30"W
685	ME	TRAIL N OF SUSUA 229SP06	290, 39 NE	285, 80 NE	TOP TO SW	38, 010			18°04'59"N; 66°54'30"W
686	ME	TRAIL N OF SUSUA 230SP06	190, 73 NW	210, 16 NW	TOP TO W	72, 259			18°04'57"N; 66°54'31"W
687	ME	TRAIL S OF SUSUA 231SP06	229, 85 NW	351, 73 SW	TOP TO NE	17, 047			18°03'25"N; 66°54'18"W
688	ME	TRAIL S OF SUSUA 231SP06	177, 77 NE	131, 71 SW	TOP TO S	33, 006			18°03'25"N; 66°54'18"W

689	ME	TRAIL S OF SUSUA 231SP06	203, 52 SE	190, 73 SE	TOP TO SW	42, 068		18°03'25"N; 66°54'18"W
690	ME	TRAIL S OF SUSUA 232SP06	236, 20 NW	262, 41 NW	TOP TO S	15, 012		18°03'25"N; 66°54'20"W
691	ME	TRAIL S OF SUSUA 232SP06	341, 05 SW	250, 46 NW	TOP TO SE	00, 345		18°03'25"N; 66°54'20"W
692	ME	TRAIL S OF SUSUA 232SP06	206, 34 SE	314, 47 NE	TOP TO SE	09, 193		18°03'25"N; 66°54'20"W
693	ME	TRAIL S OF SUSUA 232SP06	255, 26 NW	248, 40 NW	TOP TO S	25, 324		18°03'25"N; 66°54'20"W
694	ME	TRAIL S OF SUSUA 232SP06	182, 27 SE	256, 70 NW	TOP TO S	11, 161		18°03'25"N; 66°54'20"W
695	ME	TRAIL S OF SUSUA 232SP06	289, 18 NE	235, 33 SE	TOP TO N	14, 339		18°03'25"N; 66°54'20"W
696	ME	TRAIL S OF SUSUA 232SP06	269, 20 NW	189, 22 SE	TOP TO NW	14, 312		18°03'25"N; 66°54'20"W
697	ME	TRAIL S OF SUSUA 232SP06	232, 25 NW	264, 15 SE	TOP TO NW	24, 336		18°03'25"N; 66°54'20"W
698	ME	TRAIL S OF SUSUA 233SP06	217, 09 SE	260, 55 SE	TOP TO N	06, 176		18°03'30"N; 66°54'24"W
699	ME	TRAIL S OF SUSUA 235SP06	246, 32 NW	040, 45 NW	TOP TO SE	14, 270		18°03'36"N; 66°54'28"W
700	ME	TRAIL S OF SUSUA 235SP06	280, 60 NE	229, 60 NW	TOP TO SE	11, 093		18°03'36"N; 66°54'28"W
701	ME	TRAIL S OF SUSUA 236SP06	286, 55 SW	298, 24 SW	TOP TO S	53, 180	40, 150; N	18°03'42"N; 66°54'27"W
702	ME	TRAIL S OF SUSUA 236SP06	286, 69 SW	278, 81 NE	TOP TO N	65, 158		18°03'42"N; 66°54'27"W
703	ME	TRAIL S OF SUSUA 238SP06	235, 26 NW	318, 16 NE	TOP TO SW	21, 287		18°03'54"N; 66°54'26"W
704	ME	TRAIL S OF SUSUA 238SP06	266, 35 SE	206, 05 SE	TOP TO S	35, 186		18°03'54"N; 66°54'26"W
705	ME	TRAIL S OF SUSUA 238ASP06	344, 15 SW	295, 54 SW	TOP TO NE	07, 193		18°03'57"N; 66°54'27"W
706	ME	TRAIL S OF SUSUA 238ASP06	287. 20 SW	247, 35 NW	TOP TO SW	18, 167		18°03'57"N; 66°54'27"W
707	ME	TRAIL S OF SUSUA 239SP06	197, 34 SE	231, 10 SE	TOP TO SE	33, 079		18°03'57"N; 66°54'30"W
708	ME	TRAIL S OF SUSUA 239SP06	220, 12 SE	234, 18 NW	TOP TO SE	12, 138		18°03'57"N; 66°54'30"W
709	ME	RANCHERA TRAIL 241SP06	283, 64 NE	315, 83 NE	TOP TO W	23, 091		18°05'16"N; 66°53'51"W
710	ME	RANCHERA TRAIL 241SP06	311, 37 NE	327, 63 NE	TOP TO W	31, 078		18°05'16"N; 66°53'51"W
711	ME	RANCHERA TRAIL 241SP06	282, 87 NE	324, 88 NE	TOP TO W	00, 102	MAP IT; SOME M	18°05'16"N; 66°53'51"W

								THICK	
712	ME	RANCHERA TRAIL 241SP06	302, 57 NE	337, 58 NE	TOP TO NW	07, 306			18°05'16"N; 66°53'51"W
713	ME	RANCHERA TRAIL 242SP06	260, 43 NW	326, 62 NE	TOP TO W	03, 263		CUTS F596 AND F597	18°05'15"N; 66°54'01"W
714	ME	RANCHERA TRAIL 242SP06	330, 21 NE	244, 34 NW	TOP TO E	09, 126			18°05'15"N; 66°54'01"W
715	ME	RANCHERA TRAIL 242SP06	272, 46 NE	319, 75 NE	TOP TO W	15, 077			18°05'15"N; 66°54'01"W
716	ME	RANCHERA TRAIL 242SP06	335, 57 SW	332, 64 NE	TOP TO NE	57, 238			18°05'15"N; 66°54'01"W
717	ME	RANCHERA TRAIL 242SP06	184, 25 NW	294, 52 SW	TOP TO NE	00, 003			18°05'15"N; 66°54'01"W
718	ME	RANCHERA TRAIL 242SP06	280, 13 SW	314, 67 NE	TOP TO SW	11, 222			18°05'15"N; 66°54'01"W
719	ME	RANCHERA TRAIL 242SP06	302, 35 SW	303, 57 SW	TOP TO NE	35, 215			18°05'15"N; 66°54'01"W
720	ME	RANCHERA TRAIL 243SP06	281, 31 NE	286, 58 NE	TOP TO SW	31, 022			18°05'15"N; 66°54'04"W
721	ME	RANCHERA TRAIL 243SP06	289, 24 NE	288, 82 NE	TOP TO SW	24, 018			18°05'15"N; 66°54'04"W
722	ME	RANCHERA TRAIL 243SP06	066, 10 NW	315, 59 NE	TOP TO SW	03, 052			18°05'15"N; 66°54'04"W
723	ME	RANCHERA TRAIL 243SP06	280, 82 NE	286, 52 NE	TOP TO N	78, 322			18°05'15"N; 66°54'04"W
724	ME	RANCHERA TRAIL 243SP06	297, 60 SW	287, 80 SW	TOP TO N	51, 162			18°05'15"N; 66°54'04"W
725	ME	RANCHERA TRAIL 244SP06	256, 30 NW	262, 70 NW	TOP TO S	29, 356			18°05'12"N; 66°54'07"W
726	ME	RANCHERA TRAIL 244SP06	272, 32 NE	262, 51 NW	TOP TO S	29, 335			18°05'12"N; 66°54'07"W
727	ME	RANCHERA TRAIL 244SP06	255, 25 SE	302, 50 SW	TOP TO NE	08, 236			18°05'12"N; 66°54'07"W
728	ME	RANCHERA TRAIL 244SP06	274, 57 SW	305, 84 NE	TOP TO E	38, 244			18°05'12"N; 66°54'07"W
729	ME	RANCHERA TRAIL 244SP06	306, 57 SW	320, 69 SW	TOP TO NE	33, 281			18°05'12"N; 66°54'07"W
730	ME	Rd. S OF Rd. 105 245SP06	274, 44 NE	315, 70 NE	TOP TO W	16, 076			18°10'28"N; 67°03'31"W
731	ME	Rd. S OF Rd. 105 245SP06	276, 42 NE	343, 44 NE	TOP TO W	15, 294			18°10'28"N; 67°03'31"W
732	ME	Rd. S OF Rd. 105 245SP06	104, 50 NE	163, 71 NE	TOP TO W	04, 101			18°10'28"N; 67°03'31"W
733	ME	Rd. S OF Rd. 105 246SP06	294, 72 NE	306, 78 SW	TOP TO SW	62, 077			18°10'19"N; 67°03'32"W
734	ME	Rd. S OF Rd. 105 246SP06	278, 50 NE	330, 63 NE	TOP TO W	00, 098			18°10'19"N; 67°03'32"W
735	ME	Rd. S OF Rd. 105 246SP06	282, 77 NE	278, 62 NE	TOP TO	71, 059		C. SH733,	18°10'19"N; 67°03'32"W

					NE		SH734; 30 CM	
736	ME	Rd. S OF Rd. 105 246SP06	280, 35 NE	314, 75 NE	TOP TO SW	23, 063	1.5 M THICK	18°10'19"N; 67°03'32"W
737	ME	Rd. S OF Rd. 105 246SP06	287, 35 NE	287, 56 NE	TOP TO SW	35, 017		18°10'19"N; 67°03'32"W
738	ME	Rd. S OF Rd. 105 246SP06	280, 62 SW	260, 88 SE	TOP TO N	43, 130		18°10'19"N; 67°03'32"W
739	ME	Rd. S OF Rd. 105 246SP06	273, 40 SW	255, 49 SE	TOP TO N	18, 116		18°10'19"N; 67°03'32"W
740	ME	Rd. S OF Rd. 105 246SP06	247, 45 SE	258, 82 SE	TOP TO N	42, 181		18°10'19"N; 67°03'32"W
741	ME	Rd. S OF Rd. 105 246SP06	237, 63 NW	299, 68 NE	TOP TO SW	08, 242	CUTS FS328	18°10'19"N; 67°03'32"W
742	ME	Rd. S OF Rd. 105 247SP06	288, 51 NE	314, 63 NE	TOP TO NW	16, 094		18°10'22"N; 66°03'11"W
743	ME	Rd. S OF Rd. 105 247SP06	281, 41 NE	316, 82 SW	TOP TO NW	31, 057		18°10'22"N; 66°03'11"W
744	ME	Rd. S OF Rd. 105 247SP06	302, 88 NE	336, 89 SW	TOP TO NW	05, 122		18°10'22"N; 66°03'11"W
745	ME	Rd. S OF Rd. 105 247SP06	283, 40 NE	332, 65 NE	TOP TO NW	09, 091		18°10'22"N; 66°03'11"W
746	ME	Rd. W OFF Rd. 3345 248SP06	302, 82 NE	323, 76 NE	TOP TO NW	18, 305		18°10'38"N; 67°04'59"W
747	ME	Rd. W OFF Rd. 3345 248SP06	281, 62 NE	292, 82 NE	TOP TO SW	50, 062		18°10'38"N; 67°04'59"W
748	ME	Rd. W OFF Rd. 3345 248SP06	300, 78 NE	353, 78 NE	TOP TO NW	06, 302		18°10'38"N; 67°04'59"W
749	ME	Rd. W OFF Rd. 3345 248SP06	308, 80 NE	319, 64 NE	TOP TO NE	57, 324		18°10'38"N; 67°04'59"W
750	ME	Rd. W OFF Rd. 3345 248SP06	265, 46 SE	260, 57 SE	TOP TO NE	42, 146		18°10'38"N; 67°04'59"W
751	ME	Rd. W OFF Rd. 3345 248SP06	288, 06 SW	198, 37 SE	TOP TO NW	01, 280		18°10'38"N; 67°04'59"W
752	ME	Rd. W OFF Rd. 3345 248SP06	312, 36 NE	344, 52 NE	TOP TO NW	14, 113		18°10'38"N; 67°04'59"W
753	ME	Rd. W OFF Rd. 3345 249SP06	280, 61 SW	276, 90	TOP TO N	60, 174		18°10'32"N; 67°04'55"W
754	ME	Rd. W OFF Rd. 3345 249SP06	250, 17 SE	228, 62 SE	TOP TO N	15, 132		18°10'32"N; 67°04'55"W
755	ME	Rd. W OFF Rd. 3345 249SP06	244, 47 SE	248, 68 SE	TOP TO N	46, 168		18°10'32"N; 67°04'55"W
756	ME	Rd. W OFF Rd. 3345 249SP06	332, 81 SW	283, 85 SW	TOP TO NW	01, 152		18°10'32"N; 67°04'55"W
757	ME	Rd. W OFF Rd. 3345 249SP06	294, 20 SW	273, 65 SW	TOP TO N	18, 176		18°10'32"N; 67°04'55"W

758	ME	Rd. W OFF Rd. 3345 249SP06	288, 50 SW	290, 86 SW	TOP TO N	50, 204		18°10'32"N; 67°04'55"W
759	ME	Rd. W OFF Rd. 3345 249SP06	350, 18 SW	291, 76 SW	TOP TO N	08, 195		18°10'32"N; 67°04'55"W
760	ME	Rd. W OFF Rd. 3345 250SP06	340, 29 SW	301, 63 SW	TOP TO N	15, 191		18°10'34"N; 67°04'57"W
761	ME	Rd. W OFF Rd. 3345 250SP06	312, 59 SW	292, 88 NE	TOP TO N	46, 170		18°10'34"N; 67°04'57"W
762	ME	Rd. W OFF Rd. 3345 250SP06	343, 73 SW	315, 68 NE	TOP TO N	51, 185		18°10'34"N; 67°04'57"W
763	ME	Rd. W OFF Rd. 3345 250SP06	335, 60 SW	295, 22 NE	TOP TO SW	57, 219		18°10'34"N; 67°04'57"W
764	ME	Rd. W OFF Rd. 3345 250SP06	321, 23 SW	295, 61 SW	TOP TO N	19, 194		18°10'34"N; 67°04'57"W
765	ME	Rd. W OFF Rd. 3345 250SP06	352, 34 SW	278, 54 SW	TOP TO N	06, 343		18°10'34"N; 67°04'57"W
766	ME	Rd. BETW 119 AND 348 251SP06	331, 90	354, 87 SW	NE SIDE TO NW	08, 151		18°09'34"N; 67°02'53"W
767	ME	Rd. BETW 119 AND 348 251SP06	317, 84 NE	349, 87 SW	TOP TO N	15, 136		18°09'34"N; 67°02'53"W
768	ME	Rd. BETW 119 AND 348 251SP06	348, 53 NE	348, 86 SW	TOP TO NW	53, 078		18°09'34"N; 67°02'53"W
769	ME	Rd. BETW 119 AND 348 251SP06	309, 70 NE	356, 65 NE	TOP TO NW	14, 314		18°09'34"N; 67°02'53"W
770	ME	Rd. BETW 119 AND 348 251SP06	329, 46 NE	211, 58 SE	TOP TO NW	06, 334		18°09'34"N; 67°02'53"W
771	ME	Rd. BETW 119 AND 348 251SP06	320, 41 NE	262, 55 NW	TOP TO SE	03, 137		18°09'34"N; 67°02'53"W
772	ME	Rd. BETW 119 AND 348 251SP06	308, 70 NE	273, 80 NE	TOP TO SE	11, 312		18°09'34"N; 67°02'53"W
773	ME	Rd. BETW 119 AND 348 251SP06	353, 90	304, 65 NE	WEST SIDE TO N	32, 173		18°09'34"N; 67°02'53"W
774	ME	Rd. BETW 119 AND 348 251SP06	226, 45 NW	276, 19 NE	TOP TO NW	40, 281		18°09'34"N; 67°02'53"W
775	ME	Rd. BETW 119 AND 348 251SP06	252, 51 NW	200, 54 NW	TOP TO E	10, 064		18°09'34"N; 67°02'53"W
776	ME	Rd. BETW 119 AND 348 251SP06	282, 46 NE	321, 83 NE	TOP TO W	25, 076		18°09'34"N; 67°02'53"W
777	ME	Rd. BETW 119 AND 348 251SP06	320, 43 NE	348, 81 NE	TOP TO W	31, 101		18°09'34"N; 67°02'53"W
778	ME	Rd. BETW 119 AND 348 251SP06	331, 87 NE	310, 86 NE	TOP TO N	03, 151		18°09'34"N; 67°02'53"W
779	ME	Rd. BETW 119 AND 348 251SP06	254, 83 SE	281, 68 SW	TOP TO E	32, 078		18°09'34"N; 67°02'53"W

780	ME	Rd. N OFF Rd. 348 252SP06	287, 68 NE	315, 73 NE	TOP TO SW	05, 105		18°09'31"N; 67°03'02"W
781	ME	Rd. N OFF Rd. 348 252SP06	297, 75 NE	356, 83 NE	TOP TO NW	01, 117		18°09'31"N; 67°03'02"W
782	ME	Rd. N OFF Rd. 348 252SP06	313, 65 NE	294, 24 NE	TOP TO NE	63, 068		18°09'31"N; 67°03'02"W
783	ME	Rd. N OFF Rd. 348 252SP06	284, 81 NE	334, 54 NE	TOP TO NW	39, 291		18°09'31"N; 67°03'02"W
784	ME	Rd. N OFF Rd. 348 252SP06	293, 60 NE	318, 63 NE	TOP TO SW	01, 112		18°09'31"N; 67°03'02"W
785	ME	Rd. N OFF Rd. 348 252SP06	317, 65 SW	320, 85 SW	TOP TO NE	63, 247		18°09'31"N; 67°03'02"W
786	ME	Rd. N OFF Rd. 348 252SP06	305, 66 NE	334, 84 NE	TOP TO SW	26, 113		18°09'31"N; 67°03'02"W
787	ME	Rd. N OFF Rd. 348 253SP06	305, 20 NE	287, 44 NE	TOP TO S	17, 004		18°09'27"N; 67°03'05"W
788	ME	Rd. N OFF Rd. 348 253SP06	232, 48 NW	235, 70 NW	TOP TO SE	48, 334		18°09'27"N; 67°03'05"W
789	ME	Rd. N OFF Rd. 348 253SP06	302, 15 NE	261, 47 NW	TOP TO SE	09, 338		18°09'27"N; 67°03'05"W
790	ME	Rd. N OFF Rd. 348 253SP06	344, 22 NE	276, 40 NE	TOP TO SW	03, 158		18°09'27"N; 67°03'05"W
791	ME	Rd. N OFF Rd. 348 253SP06	246, 54 NW	222, 82 NW	TOP TO SE	36, 278		18°09'27"N; 67°03'05"W
792	ME	Rd. N OFF Rd. 348 253SP06	350, 16 NE	242, 11 NW	TOP TO SE	14, 110		18°09'27"N; 67°03'05"W
793	ME	Rd. N OFF Rd. 348 253SP06	350, 62 NE	325, 36 NE	TOP TO SE	51, 129		18°09'27"N; 67°03'05"W
794	ME	Rd. N OFF Rd. 348 253SP06	334, 75 NE	320, 36 NE	TOP TO SE	71, 105		18°09'27"N; 67°03'05"W
795	ME	Rd. N OFF Rd. 348 253SP06	310, 45 NE	121, 26 NE	TOP TO NE	44, 056		18°09'27"N; 67°03'05"W
796	ME	Rd. N OFF Rd. 348 253SP06	198, 03 SE	347, 15 NE	TOP TO SW	02, 070		18°09'27"N; 67°03'05"W
797	ME	Rd. to NE OF Rd. 330 254SP06	303, 49 NE	334, 67 SW	TOP TO W	41, 074		18°09'44"N; 67°03'036"W
798	ME	Rd. to NE OF Rd. 330 254SP06	290, 55 NE	138, 81 NE	TOP TO SW	31, 086		18°09'44"N; 67°03'036"W
799	ME	Rd. to NE OF Rd. 330 254SP06	278, 83 NE	328, 61 SW	TOP TO W	39, 093		18°09'44"N; 67°03'036"W
800	ME	Rd. to NE OF Rd. 330 254SP06	316, 88 SW	341, 71 SW	TOP TO SE	37, 137		18°09'44"N; 67°03'036"W
801	ME	Rd. to NE OF Rd. 330 254SP06	285, 53 NE	301, 86 NE	TOP TO SW	45, 056		18°09'44"N; 67°03'036"W
802	ME	Rd. to NE OF Rd. 330 254SP06	312, 51 NE	322, 74 NE	TOP TO SW	46, 076		18°09'44"N; 67°03'036"W

803	ME	Rd. to NE OF Rd. 330 254SP06	342, 15 SW	316, 37 NE	TOP TO SW	15, 232		18°09'44"N; 67°03'036"W
804	ME	Rd. to NE OF Rd. 330 254SP06	115, 26 NE	172, 53 NE	TOP TO W	05, 106		18°09'44"N; 67°03'036"W
805	ME	Rd. to NE OF Rd. 330 254SP06	335, 63 NE	356, 40 NE	TOP TO NE	51, 014		18°09'44"N; 67°03'036"W
806	ME	Rd. to NE OF Rd. 330 254SP06	342, 48 NE	225, 17 SE	TOP TO E	43, 039		18°09'44"N; 67°03'036"W
807	ME	Rd. to NE OF Rd. 330 255SP06	290, 85 NE	270, 53 N	TOP TO NE	62, 100		18°09'46"N; 67°03'31"W
808	ME	Rd. to NE OF Rd. 330 255SP06	284, 17 SW	285, 62 SW	TOP TO N	16, 178		18°09'46"N; 67°03'31"W
809	ME	Rd. to NE OF Rd. 330 255SP06	290, 58 SW	285, 76 SW	TOP TO N	55, 173		18°09'46"N; 67°03'31"W
810	ME	Rd. to NE OF Rd. 330 256SP06	290, 52 NE	338, 63 NE	TOP TO W	00, 110		18°09'48"N; 67°03'30"W
811	ME	Rd. to NE OF Rd. 330 256SP06	273, 41 NE	110, 65 NE	TOP TO SW	32, 046		18°09'48"N; 67°03'30"W
812	ME	Rd. to NE OF Rd. 330 256SP06	351, 52 NE	290, 58 NE	TOP TO S	10, 163		18°09'48"N; 67°03'30"W
813	ME	Rd. to NE OF Rd. 330 256SP06	319, 76 SW	296, 83 NE	TOP TO NW	40, 151		18°09'48"N; 67°03'30"W
814	ME	Rd. to NE OF Rd. 330 256SP06	294, 58 NE	247, 55 NW	TOP TO E	15, 105		18°09'48"N; 67°03'30"W
815	ME	Rd. to NE OF Rd. 330 256SP06	306, 32 NE	353, 08 SW	TOP TO NE	32, 047		18°09'48"N; 67°03'30"W
816	ME	Rd. TO SW OF Rd.105 257SP06	304, 35 SW	331, 57 SW	TOP TO NE	21, 271		18°11'26"N; 67°06'26"W
817	ME	Rd. TO SW OF Rd.105 257SP06	275, 18 SW	283, 37 SW	TOP TO NE	17, 200		18°11'26"N; 67°06'26"W
818	ME	Rd. TO SW OF Rd.105 257SP06	218, 55 SE	264, 51 SE	TOP TO NE	17, 050		18°11'26"N; 67°06'26"W
819	ME	Rd. TO SW OF Rd.105 257SP06	290, 04 SW	286, 56 SW	TOP TO NE	04, 196		18°11'26"N; 67°06'26"W
820	ME	Rd. TO SW OF Rd.105 257SP06	351, 45 NE	312, 57 NE	TOP TO S	06, 357	DRAGS SH819	18°11'26"N; 67°06'26"W
821	ME	Rd. TO SW OF Rd.105 257SP06	252, 26 SE	269, 59 SE	TOP TO N	23, 191		18°11'26"N; 67°06'26"W
822	ME	Rd. TO SW OF Rd.105 257SP06	257, 51 SE	279, 46 SW	TOP TO NE	19, 093		18°11'26"N; 67°06'26"W
823	ME	Q. PALMA GRANDE 258SP06	245, 18 NW	306, 55 NE	TOP TO SW	04, 050		18°10'18"N; 67°02'57"W
824	ME	Q. PALMA GRANDE 259SP06	251, 10 NW	248, 55 NW	TOP TO SE	10, 338		18°10'17"N; 67°02'51"W
825	ME	Q. PALMA GRANDE 259SP06	304, 18 NE	270, 38 N	TOP TO S	10, 337		18°10'17"N; 67°02'51"W

826	ME	Q. PALMA GRANDE 260SP06	288, 40 NE	326, 57 NE	TOP TO W	11, 095			18°10'19"N; 67°02'54"W
827	ME	Q. PALMA GRANDE 260SP06	265, 36 NW	325, 45 NE	TOP TO W	07, 275			18°10'19"N; 67°02'54"W
828	ME	Q. PALMA GRANDE 261SP06	236, 41 NW	311, 60 NE	TOP TO SW	07, 244			18°10'18"N; 67°02'53"W
829	ME	Q. PALMA GRANDE 261SP06	286, 41 NE	312, 66 NE	TOP TO SW	25, 072			18°10'18"N; 67°02'53"W
830	ME	Q. PALMA GRANDE 262SP06	288, 51 NE	337, 80 NE	TOP TO W	15, 095			18°10'12"N; 67°02'49"W
831	ME	Q. PALMA GRANDE 262SP06	313, 33 NE	343, 70 NE	TOP TO NW	24, 091			18°10'12"N; 67°02'49"W
832	ME	Q. PALMA GRANDE 262SP06	289, 48 NE	330, 56 NE	TOP TO W	00, 109			18°10'12"N; 67°02'49"W
833	ME	Q. PALMA GRANDE 262SP06	296, 87 NE	288, 46 NE	TOP TO NE	81, 100			18°10'12"N; 67°02'49"W
834	ME	Q. PALMA GRANDE 262SP06	354, 11 SW	311, 40 SW	TOP TO N	06, 209			18°10'12"N; 67°02'49"W
835	ME	Q. PALMA GRANDE 263SP06	276, 24 SW	334, 54 SW	TOP TO E	05, 264			18°10'09"N; 67°02'43"W
836	ME	Q. PALMA GRANDE 264SP06	273, 55 NE	280, 28 NE	TOP TO N	54, 351			18°10'08"N; 67°02'41"W
837	ME	Q. PALMA GRANDE 264SP06	231, 34 NW	232, 78 NW	TOP TO SE	34, 323			18°10'08"N; 67°02'41"W
838	ME	Q. PALMA GRANDE 264SP06	284, 47 NE	320, 68 NE	TOP TO SW	17, 087			18°10'08"N; 67°02'41"W
839	ME	Q. PALMA GRANDE 264SP06	297, 26 NE	268, 56 NW	TOP TO SE	18, 339			18°10'08"N; 67°02'41"W
840	ME	Q. PALMA GRANDE 264SP06	305, 36 NE	271, 63 NE	TOP TO S	19, 333			18°10'08"N; 67°02'41"W
841	ME	Q. PALMA GRANDE 264SP06	321, 61 NE	272, 84 NE	TOP TO S	15, 329			18°10'08"N; 67°02'41"W
842	ME	Q. PALMA GRANDE 264SP06	298, 57 SW	294, 87 NE	TOP TO NE	56, 195		CUTS SH841	18°10'08"N; 67°02'41"W
843	ME	Q. PALMA GRANDE 264SP06	282, 50 NE	285, 86 SW	TOP TO SW	49, 019			18°10'08"N; 67°02'41"W
844	ME	Q. PALMA GRANDE 264SP06	285, 52 NE	320, 10 NE	TOP TO N	52, 002			18°10'08"N; 67°02'41"W
845	ME	Q. PALMA GRANDE 265SP06	133, 31 SW	132, 60 SW	TOP TO NE	31, 220			18°10'06"N; 67°02'38"W
846	ME	Q. PALMA GRANDE 265SP06	054, 32 SE	312, 42 SW	TOP TO NE	12, 073			18°10'06"N; 67°02'38"W
847	ME	Q. PALMA GRANDE 265SP06	272, 56 NE	291, 53 NE	TOP TO N	13, 282			18°10'06"N; 67°02'38"W
848	ME	Q. PALMA GRANDE 265SP06	358, 48 NE	290, 16 SW	TOP TO NE	45, 063			18°10'06"N; 67°02'38"W

849	ME	Rd. N OFF Rd.349 266SP06	315, 46 NE	308, 70 NE	TOP TO S	44, 023			18°10'52"N; 67°05'20"W
850	ME	Rd. N OFF Rd.349 266SP06	320, 60 NE	290, 90	TOP TO S	34, 343			18°10'52"N; 67°05'20"W
851	ME	Rd. N OFF Rd.349 266SP06	215, 36 SE	297, 50 NE	TOP TO S	18, 189			18°10'52"N; 67°05'20"W
852	ME	Rd. N OFF Rd.349 266SP06	249, 78 SE	270, 85 S	TOP TO E	17, 245			18°10'52"N; 67°05'20"W
853	ME	Rd. N OFF Rd.349 266SP06	293, 37 NE	294, 70 NE	TOP TO S	37, 025			18°10'52"N; 67°05'20"W
854	G	Rd.2 ENT SAN GERMAN 267SP06	303, 47 NE	328, 88 SW	TOP TO SW	38, 077			18°05'20"N; 67°01'43"W
855	G	Rd.2 ENT SAN GERMAN 267SP06	333, 48 NE	322, 88 NE	TOP TO SW	46, 040			18°05'20"N; 67°01'43"W
856	G	Rd.2 ENT SAN GERMAN 267SP06	304, 53 NE	321, 38 SW	TOP TO SW	52, 050			18°05'20"N; 67°01'43"W
857	G	Rd.2 ENT SAN GERMAN 267SP06	245, 18 NW	340, 66 NE	TOP TO W	03, 257			18°05'20"N; 67°01'43"W
858	G	Rd.2 ENT SAN GERMAN 267SP06	281, 30 NE	296, 65 NE	TOP TO SW	27, 037			18°05'20"N; 67°01'43"W
859	ME	TRAIL TO SALTO CURET 269SP06	318, 83 NE	290, 80 SW	TOP TO SE	31, 322			18°09'53"N; 66°57'40"W
860	ME	RIO LAJAS 270SP06	313, 68 NE	290, 70 NE	TOP TO SE	01, 313			18°09'53"N; 66°57'37"W
861	ME	RIO LAJAS 270SP06	302, 85 SW	262, 81 NW	TOP TO NW	19, 124			18°09'53"N; 66°57'37"W
862	ME	RIO LAJAS 270SP06	318, 61 SW	286, 62 SW	TOP TO NW	05, 315			18°09'53"N; 66°57'37"W
863	ME	RIO LAJAS 270SP06	277, 65 SW	303, 56 SW	TOP TO E	42, 121			18°09'53"N; 66°57'37"W
864	ME	RIO LAJAS 271SP06	270, 78 N	255, 83 SE	TOP TO S	49, 284			18°09'52"N; 66°57'40"W
865	ME	RIO LAJAS 271SP06	263, 16 NW	257, 60 NW	TOP TO SE	16, 345			18°09'52"N; 66°57'40"W
866	ME	RIO LAJAS 271SP06	312, 83 NE	286, 78 NE	TOP TO SE	13, 130			18°09'52"N; 66°57'40"W
867	ME	RIO LAJAS 271SP06	294, 50 SW	300, 66 SW	TOP TO NE	46, 233			18°09'52"N; 66°57'40"W
868	ME	RIO LAJAS 271SP06	288, 72 NE	262, 80 NW	TOP TO S	14, 292			18°09'52"N; 66°57'40"W
869	ME	RIO LAJAS 271SP06	287, 47 NE	246, 78 NW	TOP TO SE	21, 308			18°09'52"N; 66°57'40"W
870	ME	RIO LAJAS 271SP06	310, 72 NE	251, 69 NW	TOP TO SE	13, 126			18°09'52"N; 66°57'40"W
871	ME	TRAIL RIO LAJAS 272SP06	292, 63 SW	279, 70 SW	TOP TO NW	07, 115			18°09'51"N; 66°57'40"W
872	ME	TRAIL RIO LAJAS 273SP06	285, 16 SW	350, 29 SW	TOP TO SE	02, 111		???	18°09'53"N; 66°57'37"W

873	ME	TRAIL RIO LAJAS 273SP06	260, 55 SE	236, 58 SE	TOP TO W	01, 081		18°09'53"N; 66°57'37"W
874	ME	TRAIL RIO LAJAS 273SP06	346, 16 SW	352, 17 NE	TOP TO W	16, 259		18°09'53"N; 66°57'37"W
875	ME	TRAIL RIO LAJAS 273SP06	301, 87 NE	282, 84 NE	TOP TO SE	10, 121		18°09'53"N; 66°57'37"W
876	ME	RIO LAJAS 274SP06	287, 60 SW	263, 84 SE	TOP TO NW	35, 131		18°09'47"N; 66°57'21"W
877	ME	T RIO LAJAS TO BONELLI 275SP06	295, 65 NE	328, 78 NE	TOP TO NW	15, 108		18°09'39"N; 66°57'17"W
878	ME	T RIO LAJAS TO BONELLI 275SP06	275, 74 NE	318, 71 NE	TOP TO NW	10, 278	CUTS SH879?	18°09'39"N; 66°57'17"W
879	ME	T RIO LAJAS TO BONELLI 275SP06	307, 76 NE	268, 77 NW	TOP TO SE	03, 127		18°09'39"N; 66°57'17"W
880	ME	T RIO LAJAS TO BONELLI 275SP06	296, 83 NE	323, 86 SW	TOP TO NW	21, 114		18°09'39"N; 66°57'17"W
881	ME	T RIO LAJAS TO BONELLI 276SP06	280, 20 NE	250, 62 NW	TOP TO SE	16, 330		18°09'48"N; 66°57'13"W
882	ME	T RIO LAJAS TO BONELLI 276SP06	280, 76 NE	319, 58 NE	TOP TO W	32, 289		18°09'48"N; 66°57'13"W
883	ME	T RIO LAJAS TO BONELLI 276SP06	193, 65 SE	332, 69 NE	TOP TO S	02, 192		18°09'48"N; 66°57'13"W
884	ME	T RIO LAJAS TO BONELLI 276SP06	339, 44 NE	303, 63 NE	TOP TO SE	15, 354		18°09'48"N; 66°57'13"W
885	ME	T RIO LAJAS TO BONELLI 277SP06	258, 59 SE	285, 73 SW	TOP TO E	20, 246		18°09'43"N; 66°57'10"W
886	ME	T RIO LAJAS TO BONELLI 277SP06	284, 83 SW	310, 83 NE	TOP TO SE	28, 280		18°09'43"N; 66°57'10"W
887	G	Rd. 329 279SP06	285, 49 NE	305, 68 NE	TOP TO SW	30, 074		18°03'03"N; 66°59'40"W
888	G	Rd. 329 279SP06	341, 72 NE	340, 50 NE	TOP TO E	72, 078		18°03'03"N; 66°59'40"W
889	G	Rd. 329 279SP06	194, 86 SE	193, 56 SE	TOP TO E	86, 131		18°03'03"N; 66°59'40"W
890	G	TRAIL OFF Rd. 329 280SP06	290, 76 NE	306, 83 SW	TOP TO SW	49, 093		18°03'05"N; 66°59'41"W
891	ME	HOUSING OFF Rd.368 281SP06	202, 32 SE	183, 10 SE	TOP TO SE	31, 121		18°04'16"N; 66°56'00"W
892	ME	HOUSING OFF Rd.368 281SP06	316, 36 NE	195, 58 SE	TOP TO NE	02, 133		18°04'16"N; 66°56'00"W
893	ME	HOUSING OFF Rd.368 281SP06	290, 40 NE	167, 25 NE	TOP TO N	29, 331		18°04'16"N; 66°56'00"W
894	ME	HOUSING OFF Rd.368 281SP06	303, 57 NE	334, 37 NE	TOP TO N	40, 338		18°04'16"N; 66°56'00"W
895	ME	HOUSING OFF Rd.368 281SP06	335, 87 NE	194, 84 SE	TOP TO N	06, 335		18°04'16"N; 66°56'00"W
896	ME	HOUSING OFF Rd.368	311, 73 NE	211, 18 SE	TOP TO	65, 351	CUTS SH895	18°04'16"N; 66°56'00"W

		281SP06			N				
897	ME	HOUSING OFF Rd.368 281SP06	283, 30 NE	229, 51 NW	TOP TO SE	03, 289			18°04'16"N; 66°56'00"W
898	ME	HOUSING OFF Rd.368 281SP06	328, 47 NE	305, 73 NE	TOP TO SE	31, 004			18°04'16"N; 66°56'00"W
899	ME	HOUSING OFF Rd.368 281SP06	310, 81 NE	197, 83 SE	TOP TO NW	09, 125			18°04'16"N; 66°56'00"W
900	ME	HOUSING OFF Rd.368 282SP06	165, 75 SW	185, 60 NW	TOP TO W	41, 178			18°04'10"N; 66°55'54"W
901	ME	HOUSING OFF Rd.368 282SP06	215, 24 NW	197, 36 SE	TOP TO NW	23, 292		CUTS SH900	18°04'10"N; 66°55'54"W
902	ME	PLANT. OFF Rd.366 284SP06	226, 63 SE	352, 36 NE	TOP TO S	43, 198			18°08'51"N; 66°57'02"W
903	ME	PLANT. OFF Rd.366 284SP06	213, 87 NW	214, 49 SE	TOP TO SE	87, 322			18°08'51"N; 66°57'02"W
904	ME	PLANT. OFF Rd.366 284SP06	205, 58 SE	319, 35 NE	TOP TO S	39, 175			18°08'51"N; 66°57'02"W
905	ME	PLANT. OFF Rd.366 284SP06	184, 76 SE	344, 63 NE	TOP TO SE	37, 174			18°08'51"N; 66°57'02"W
906	ME	PLANT. OFF Rd.366 284SP06	200, 40 SE	296, 32 NE	TOP TO S	26, 164			18°08'51"N; 66°57'02"W
907	ME	PLANT. OFF Rd.366 284SP06	275, 14 NE	192, 24 SE	TOP TO N	07, 307			18°08'51"N; 66°57'02"W
908	ME	PLANT. OFF Rd.366 284SP06	269, 13 NW	227, 32 SE	TOP TO N	11, 327			18°08'51"N; 66°57'02"W
909	ME	PLANT. OFF Rd.366 284SP06	256, 65 SE	301, 83 SW	TOP TO E	13, 249			18°08'51"N; 66°57'02"W
910	ME	PLANT. OFF Rd.366 284SP06	228, 66 SE	284, 57 SW	TOP TO NE	21, 058			18°08'51"N; 66°57'02"W
911	ME	PLANT. OFF Rd.366 284SP06	351, 40 NE	302, 57 NE	TOP TO SE	04, 356			18°08'51"N; 66°57'02"W
912	ME	PLANT. OFF Rd.366 284SP06	172, 52 NE	320, 75 NE	TOP TO S	23, 012			18°08'51"N; 66°57'02"W
913	ME	PLANT. OFF Rd.366 284SP06	200, 66 SE	246, 51 SE	TOP TO NE	30, 034			18°08'51"N; 66°57'02"W
914	ME	PLANT. OFF Rd.366 284SP06	242, 55 SE	175, 72 NE	TOP TO SW	02, 240			18°08'51"N; 66°57'02"W
915	ME	PLANT. OFF Rd.366 284SP06	185, 45 SE	290, 35 NE	TOP TO S	27, 153			18°08'51"N; 66°57'02"W
916	ME	PLANT. OFF Rd.366 284SP06	221, 53 SE	335, 51 NE	TOP TO S	19, 206			18°08'51"N; 66°57'02"W
917	ME	PLANT. OFF Rd.366 284SP06	335, 40 NE	248, 48 NW	TOP TO SE	17, 132			18°08'51"N; 66°57'02"W
918	ME	PLANT. OFF Rd.366 284SP06	232, 25 SE	272, 48 NE	TOP TO S	22, 175		CUTS SH919	18°08'51"N; 66°57'02"W

919	ME	PLANT. OFF Rd.366 284SP06	200, 08 SE	258, 35 SE	TOP TO NE	02, 179			18°08'51"N; 66°57'02"W
920	ME	PLANT. OFF Rd.366 284SP06	328, 23 NE	265, 50 NW	TOP TO SE	02, 333			18°08'51"N; 66°57'02"W
921	ME	PLANT. OFF Rd.366 284SP06	277, 33 NE	261, 63 NW	TOP TO SE	29, 335			18°08'51"N; 66°57'02"W
922	ME	PLANT. OFF Rd.366 284SP06	222, 28 SE	302, 55 NE	TOP TO SW	12, 199			18°08'51"N; 66°57'02"W
923	ME	PLANT. OFF Rd.366 284SP06	218, 85 SE	176, 75 NE	TOP TO SW	17, 216			18°08'51"N; 66°57'02"W
924	G	PRIV. PROP. 285SP06	099, 30 NE	142, 52 NE	TOP TO SW	09, 082			18°03'19"N; 66°58'55"W
925	G	PRIV. PROP. 285SP06	262, 31 NW	290, 42 NE	TOP TO SW	11, 063			18°03'19"N; 66°58'55"W
926	G	PRIV. PROP. 285SP06	270, 28 N	320, 41 NE	TOP TO W	01, 088			18°03'19"N; 66°58'55"W
927	G	PRIV. PROP. 285SP06	254, 34 NW	303, 42 NE	TOP TO W	03, 259			18°03'19"N; 66°58'55"W
928	G	PRIV. PROP. 285SP06	120, 07 NE	346, 24 NE	TOP TO W	03, 090			18°03'19"N; 66°58'55"W
929	G	Rd. 362 288SP06	337, 21 SW	220, 31 SE	TOP TO WSW	16, 290			18°05'17"N; 67°01'24"W
930	G	Rd. 362 288SP06	211, 12 NW	204, 20 SE	TOP TO W	12, 297			18°05'17"N; 67°01'24"W
931	G	Q Rd.328 AND Rd.321 289SP06	270, 58 N		TOP TO S			CONTACT QUARTZITE-MAFIC	18°03'57"N; 66°57'12"W
932	G	Q Rd.328 AND Rd.321 289SP06	266, 83 NW	PARALLEL	?			VOLCANIC MAFIC	18°03'57"N; 66°57'12"W
933	G	Rd. OFF Rd.318 290SP06	221, 58 NW	264, 56 NW	TOP TO SW	13, 229			18°04'48"N; 67°03'44"W
934	G	Rd. OFF Rd.318 290SP06	302, 62 NE	307, 76 NE	TOP TO SW	57, 069			18°04'48"N; 67°03'44"W
935	G	Rd. OFF Rd.318 290SP06	286, 59 NE	306, 83 NE	TOP TO SW	39, 076			18°04'48"N; 67°03'44"W
936	G	Rd. OFF Rd.318 290SP06	314, 47 NE	302, 76 NE	TOP TO SW	42, 012			18°04'48"N; 67°03'44"W
937	G	Rd. OFF Rd.318 290SP06	230, 54 NW	267, 83 NW	TOP TO SW	25, 031			18°04'48"N; 67°03'44"W
938	G	LA MOCA OFF Rd. 314 291SP06	295, 72 NE	296, 64 SW	TOP TO SW	72, 028		NEAR CONTACT	18°04'50"N; 67°04'21"W
939	G	LA MOCA OFF Rd. 314 291SP06	290, 64 NE	290, 63 SW	TOP TO SW	64, 020			18°04'50"N; 67°04'21"W
940	G	LA MOCA OFF Rd. 314 291SP06	286, 85 NE	316, 79 SW	TOP TO W	28, 103			18°04'50"N; 67°04'21"W

941	G	LA MOCA OFF Rd. 314 291SP06	307, 89 NE	325, 53 SW	TOP TO SW	68, 126		NEAR CONTACT	18°04'50"N; 67°04'21"W
942	G	LA MOCA OFF Rd. 314 291SP06	283, 60 NE	318, 67 NE	TOP TO WSW	04, 101			18°04'50"N; 67°04'21"W
943	G	LA MOCA OFF Rd. 314 291SP06	304, 32 NE	318, 50 NE	TOP TO WSW	27, 071			18°04'50"N; 67°04'21"W
944	G	LA MOCA OFF Rd. 314 291SP06	318, 28 NE	317, 62 NE	TOP TO WSW	29, 048			18°04'50"N; 67°04'21"W
945	G	LA MOCA OFF Rd. 314 291SP06	302, 23 NE	301, 84 NE	TOP TO SW	23, 031			18°04'50"N; 67°04'21"W
946	G	LA MOCA OFF Rd. 314 291SP06	304, 54 NE	315, 85 NE	TOP TO SW	50, 067			18°04'50"N; 67°04'21"W
947	G	LA MOCA OFF Rd. 314 291SP06	292, 37 NE	326, 80 NE	TOP TO SW	25, 073			18°04'50"N; 67°04'21"W
948	G	Rd. 314 292SP06	338, 22 SW	337, 51 SW	TOP TO ENE	21, 247			18°04'50"N; 67°04'17"W
949	G	Rd. 314 292SP06	353, 54 SW	352, 76 SW	TOP TO ENE	54, 258			18°04'50"N; 67°04'17"W
950	G	Rd. 314 292SP06	208, 10 NW	338, 41 NE	TOP TO WSW	07, 255			18°04'50"N; 67°04'17"W
951	G	Rd. 314 292SP06	315, 20 NE	330, 62 NE	TOP TO SW	19, 066			18°04'50"N; 67°04'17"W
952	G	Rd. 314 292SP06	221, 13 NW	342, 60 NE	TOP TO WSW	08, 257			18°04'50"N; 67°04'17"W
953	G	Rd. 314 292SP06	298, 56 NE	319, 86 SW	TOP TO SW	45, 076			18°04'50"N; 67°04'17"W
954	G	T NW OFF Rd. 3362 293SP06	281, 65 SW	259, 71 SE	TOP TO NW	11, 106			18°05'03"N; 67°00'46"W
955	G	T NW OFF Rd. 3362 293SP06	268, 40 SE	252, 49 SE	TOP TO NW	20, 114			18°05'03"N; 67°00'46"W
956	G	T NW OFF Rd. 3362 293SP06	283, 50 SW	257, 81 SE	TOP TO NW	34, 136			18°05'03"N; 67°00'46"W
957	G	T NW OFF Rd. 3362 293SP06	288, 77 SW	274, 83 SW	TOP TO N	22, 113			18°05'03"N; 67°00'46"W
958	ME	T NW OFF Rd. 3362 293SP06	299, 53 SW	296, 86 NE	TOP TO N	53, 201			18°05'03"N; 67°00'46"W
959	ME	URB. COMP. Rd. 348 294SP06	310, 89 NE	347, 60 NE	TOP TO NE	43, 311			18°11'30"N; 67°08'05"W
960	ME	URB. COMP. Rd. 348 294SP06	320, 82 NE	337, 65 NE	TOP TO NE	48, 329			18°11'30"N; 67°08'05"W
961	ME	URB. COMP. Rd. 348 294SP06	320, 76 SW	337, 77 NE	TOP TO NE	55, 299			18°11'30"N; 67°08'05"W
962	ME	URB. COMP. Rd. 348 294SP06	343, 87 SW	182, 73 SE	TOP TO ENE	47, 340			18°11'30"N; 67°08'05"W
963	ME	URB. COMP. Rd. 348 294SP06	327, 80 NE	315, 52 NE	TOP TO NE	69, 121			18°11'30"N; 67°08'05"W

964	ME	URB. COMP. Rd. 348 294SP06	329, 55 SW	180, 87 E	TOP TO E	36, 298			18°11'30"N; 67°08'05"W
965	ME	URB. COMP. Rd. 348 294SP06	323, 84 SW	351, 72 NE	TOP TO NE	41, 318			18°11'30"N; 67°08'05"W
966	ME	URB. COMP. Rd. 348 294SP06	309, 62 SW	320, 65 NE	TOP TO NE	60, 244			18°11'30"N; 67°08'05"W
967	ME	URB. COMP. Rd. 348 294SP06	310, 87 NE	351, 38 NE	TOP TO NE	62, 316	37, 312		18°11'30"N; 67°08'05"W
968	ME	URB. COMP. Rd. 348 294SP06	146, 87 NE	349, 57 NE	TOP TO NE	57, 331			18°11'30"N; 67°08'05"W
969	ME	URB. COMP. Rd. 348 294SP06	330, 70 SW	342, 88 NE	TOP TO NE	55, 299			18°11'30"N; 67°08'05"W
970	ME	URB. COMP. Rd. 348 294SP06	285, 67 SW	167, 66 SW	TOP TO NE	13, 111		CUTS SH971	18°11'30"N; 67°08'05"W
971	ME	URB. COMP. Rd. 348 294SP06	335, 88 NE	340, 65 NE	TOP TO NE	78, 345			18°11'30"N; 67°08'05"W
972	ME	URB. COMP. Rd. 348 294SP06	345, 68 SW	345, 60 NE	TOP TO NE	68, 255			18°11'30"N; 67°08'05"W
973	ME	URB. COMP. Rd. 348 294SP06	304, 63 SW	351, 76 SW	TOP TO ENE	06, 301			18°11'30"N; 67°08'05"W
974	ME	URB. COMP. Rd. 348 294SP06	318, 44 SW	345, 57 SW	TOP TO NE	16, 301			18°11'30"N; 67°08'05"W
975	ME	URB. COMP. Rd. 348 294SP06	348, 26 SW	180, 52 W	TOP TO SE	24, 281			18°11'30"N; 67°08'05"W
976	ME	URB. COMP. Rd. 348 294SP06	322, 42 SW	345, 72 SW	TOP TO E	31, 280			18°11'30"N; 67°08'05"W
977	ME	URB. COMP. Rd. 348 294SP06	324, 88 NE	352, 41 NE	TOP TO NE	67, 329			18°11'30"N; 67°08'05"W
978	ME	URB. COMP. Rd. 348 294SP06	340, 41 NE	185, 78 NW	TOP TO SE	36, 104			18°11'30"N; 67°08'05"W
979	ME	Rd. OFF Rd.349 295SP06	225, 38 NW	226, 53 NW	TOP TO SE	38, 319			18°11'38"N; 67°07'58"W
980	ME	Rd. OFF Rd.349 295SP06	247, 26 NW	229, 43 NW	TOP TO SE	20, 295			18°11'38"N; 67°07'58"W
981	ME	Rd. to S FROM Rd.349 296SP06	280, 23 NE	305, 38 NE	TOP TO SW	14, 064			18°10'54"N; 67°06'36"W
982	ME	Rd. to S FROM Rd.349 296SP06	290, 33 NE	305, 55 NE	TOP TO SW	28, 056			18°10'54"N; 67°06'36"W
983	ME	Rd. to S FROM Rd.349 296SP06	297, 27 NE	330, 64 NE	TOP TO SW	18, 076			18°10'54"N; 67°06'36"W
984	ME	Rd. to S FROM Rd.349 296SP06	335, 14 NE	353, 48 NE	TOP TO W	13,089			18°10'54"N; 67°06'36"W
985	ME	Rd. to S FROM Rd.349 296SP06	287, 47 NE	277, 43 NE	TOP TO NE	24, 083			18°10'54"N; 67°06'36"W
986	ME	Rd. to S FROM Rd.349 296SP06	300, 51 NE	321, 62 NE	TOP TO SW	20, 103			18°10'54"N; 67°06'36"W

987	ME	Rd. to S FROM Rd.349 296SP06	273, 33 NE	294, 74 NE	TOP TO SW	29, 037	18°10'54"N; 67°06'36"W
988	ME	Rd. to S FROM Rd.349 296SP06	300, 12 NE	322, 37 NE	TOP TO SW	10, 061	18°10'54"N; 67°06'36"W
989	ME	Rd. to S FROM Rd.349 296SP06	307, 37 NE	310, 67 NE	TOP TO SW	37, 044	18°10'54"N; 67°06'36"W
990	ME	Rd. to S FROM Rd.349 296SP06	260, 30 NW	321, 64 NE	TOP TO SW	06, 070	18°10'54"N; 67°06'36"W
991	ME	Rd. to S FROM Rd.349 296SP06	245, 46 NW	322, 89 SW	TOP TO SW	07, 058	18°10'54"N; 67°06'36"W
992	ME	Rd. to S FROM Rd.349 296SP06	328, 83 NE	332, 58 SW	TOP TO SW	79, 009	18°10'54"N; 67°06'36"W
993	ME	Rd. to S FROM Rd.349 296SP06	344, 35 SW	252, 22 NW	TOP TO SW	28, 213	18°10'54"N; 67°06'36"W
994	ME	Rd. to S FROM Rd.349 296SP06	283, 15 NE	318, 47 NE	TOP TO SW	10, 060	18°10'54"N; 67°06'36"W
995	ME	Rd. to S FROM Rd.349 296SP06	280, 36 NE	302, 60 NE	TOP TO SW	26, 058	18°10'54"N; 67°06'36"W
996	ME	Rd. to S FROM Rd.349 296SP06	293, 11 NE	321, 69 NE	TOP TO SW	10, 054	18°10'54"N; 67°06'36"W
997	ME	SM. WAY OFF RD. 349 297SP06	346, 21 NE	184, 60 SE	TOP TO W	19, 102	18°10'56"N; 67°06'57"W
998	ME	SM. WAY OFF RD. 349 297SP06	307, 18 NE	190, 45 SE	TOP TO NW	02, 120	18°10'56"N; 67°06'57"W
999	ME	SM. WAY OFF RD. 349 297SP06	331, 22 NE	184, 41 SE	TOP TO NW	12, 120	18°10'56"N; 67°06'57"W
1000	ME	SM. WAY OFF RD. 349 297SP06	295, 13 NE	348, 18 NE	TOP TO NW	02, 302	18°10'56"N; 67°06'57"W
1001	ME	Rio Bonelli 298SP06	276, 30 SW	185, 43 NW	N TOP TO SE	14, 120	18°09'58"N; 66°58'05"W
1002	ME	Rio Bonelli 298SP06	285, 22 SW	313, 22 SW	TOP TO SE	05, 117	18°09'58"N; 66°58'05"W
1003	ME	Rio Bonelli 299SP06	278, 40 SW	288, 80 SW	R TOP TO N	38, 208	18°09'59"N; 66°57'59"W
1004	ME	Rio Bonelli 299SP06	310, 17 SW	285, 66 SW	T TOP TO N	15, 189	18°09'59"N; 66°57'59"W
1005	ME	Rio Bonelli 300SP06	300, 30 NE	326, 50 NE	TOP TO W	18, 085	18°09'56"N; 66°58'01"W
1006	ME	Rio Bonelli 301SP06	349, 30 NE	314, 38 NE	TOP TO SE		18°09'46"N; 66°57'58"W
1007	ME	Rio Bonelli 301SP06	302, 26 NE	285, 55 NE	T TOP TO S		18°09'46"N; 66°57'58"W
1008	ME	Rio Bonelli 301SP06	026, 12 SE	316, 36 NE	TOP TO S		18°09'41"N; 66°58'05"W
1009	ME	Rio Bonelli 301SP06	230, 15 SE	305, 40 NE	TOP TO S		18°09'41"N; 66°58'05"W
1010	ME	Rio Bonelli 301SP06	332, 78 SW	284, 86 NE	RL TOP TO NW		18°09'41"N; 66°58'05"W

Shear Zones in Serpentinite (SH) SUMMER 2005									
#	B.	Location	C	S	Sense	slip dir.	Stri.	Comments	GPS
1	G	BEACH 06S05	068 68 SE	287 85 SW	LL	17, 241			18°09'58"N; 67°11'03"W
2	G	BEACH 06S05	254 78 NW	275 83 NE	LL	01, 254		1-10 CM	18°09'58"N; 67°11'03"W
3	G	BEACH 08S05	201 71 SE		RL?				18°09'53"N; 67°11'08"W
4	G	BEACH 09S05	337 80 NE		RL				18°09'52"N; 67°11'08"W
5	G	BEACH 09S05	335 81 NE		RL				18°09'52"N; 67°11'08"W
6	G	BEACH 09S05	280 83 SW		LL				18°09'52"N; 67°11'08"W
7	G	BEACH 16S05	325 66 NE		RL			CUTS SH9-11	18°09'52"N; 67°11'08"W
8	G	BEACH 16S05	345 75 NE	281 86 NE	RL	03, 346		CUTS SH9-11	18°09'52"N; 67°11'08"W
9	G	BEACH 16S05	208 50 SE		?				18°09'52"N; 67°11'08"W
10	G	BEACH 16S05	214 50 SE		?				18°09'52"N; 67°11'08"W
11	G	BEACH 16S05	190 54 SE		?				18°09'52"N; 67°11'08"W
12	G	BEACH 16S05	325 28 NE	001 50 NW	TOP TO SW	25, 086			18°09'52"N; 67°11'08"W
13	G	BEACH 16S05	287 86 NE	322 82 NE	LL	08, 288			18°09'52"N; 67°11'08"W
14	G	BEACH 16S05	279 88 NE	330 90	?	02, 099		SMALL	18°09'52"N; 67°11'08"W
15	G	BEACH 17S05	286 84 NE	330 90	LL	06, 105			18°09'50"N; 67°11'08"W
16	G	OFF Rd.311 18S05	286 55 NE	294 85 NE	R	52, 042			18°07'35"N; 67°09'13"W
17	G	OFF Rd.311 18S05	280 68 NE	300 90	R	42, 079			18°07'35"N; 67°09'13"W
18	G	OFF Rd.311 18S05	260 50 NW	287 76 NE	R	30, 052			18°07'35"N; 67°09'13"W
19	G	OFF Rd.311 18S05	277 58 NE	284 85 NE	R	55, 034			18°07'35"N; 67°09'13"W
20	G	OFF Rd.311 18S05	326 27 SW	310 70 SW	R	25, 211			18°07'35"N; 67°09'13"W
21	G	OFF Rd.311 18S05	275 63 NE	313 85 SW	R	31, 077			18°07'35"N; 67°09'13"W
22	G	OFF Rd.311 18S05	278 80 NE	305 81 SW	R	34, 091			18°07'35"N; 67°09'13"W
23	G	Rd. 100 19S05	345 70 SW	273 90	RL	06, 167			18°07'47"N; 67°09'36"W
24	G	Rd. 100 19S05	310 75 SW	276 90	RL	21, 136		CUTS SH25	18°07'47"N; 67°09'36"W
25	G	Rd. 100 19S05	242 55 NW	273 50 NE	R	17, 290			18°07'47"N; 67°09'36"W
26	G	Rd. 100 19S05	238 51 NW	284 60 NE	R	00, 058			18°07'47"N; 67°09'36"W
27	G	Rd. 100 19S05	275 88 NE	295 83 SW	NORTH SIDE UP	25, 094			18°07'47"N; 67°09'36"W
28	G	Rd. 100 19S05	291 90	293 72 SW	NORTH SIDE UP	84, 111			18°07'47"N; 67°09'36"W
29	G	Rd. 100 19S05	292 45 SW	280 60 SW	R	34, 156			18°07'47"N; 67°09'36"W

30	G	Rd. 100 19S05	265 75 NW	284 71 SW	R	58, 060			18°07'47"N; 67°09'36"W
31	G	Rd. 100 19S05	304 46 NE	278 90	R	36, 349			18°07'47"N; 67°09'36"W
32	G	Rd. 100 19S05	276 79 SW	305 90	R	19, 272			18°07'47"N; 67°09'36"W
33	G	Rd. 100 19S05	313 87 SW	308 77 NE	SOUTH SIDE UP	73, 142	62 281		18°07'47"N; 67°09'36"W
34	G	Rd. 100 19S05	245 46 SE	284 90	R	28, 214			18°07'47"N; 67°09'36"W
35	G	Rd. 100 19S05	305 74 NE	268 83 NW	RL	10, 307			18°07'47"N; 67°09'36"W
36	G	Rd. 100 19S05	315 74 NE	273 90	R	16, 320			18°07'47"N; 67°09'36"W
37	G	Rd. 100 19S05	290 65 SW	302 86	R	51, 255			18°07'47"N; 67°09'36"W
38	G	Rd. 100 19S05	285 66 NE	270 90	R	50, 317			18°07'47"N; 67°09'36"W
39	G	Rd. 100 19S05	286 85 SW	261 75 SE	N	03, 055			18°07'47"N; 67°09'36"W
40	G	Rd. 100 19S05	294 86 NE	272 90	R	10, 295			18°07'47"N; 67°09'36"W
41	G	Rd. 100 19S05	309 67 NE	294 87 SW	R	51, 342			18°07'47"N; 67°09'36"W
42	G	Rd. 100 19S05	275 89 SW	304 71 NE	LL	31, 275			18°07'47"N; 67°09'36"W
43	G	Rd. 100 19S05	275 60 SW	292 84 SW	R	44, 241			18°07'47"N; 67°09'36"W
44	G	Rd. 100 19S05	335 65 NE	309 77 NE	R	19, 345			18°07'47"N; 67°09'36"W
45	G	Rd. 100 19S05	310 40 NE		R??				18°07'47"N; 67°09'36"W
46	G	QUARRY Rd.2 20S05	323 15 NE	208 33 SE	TOP TO N	00, 142			18°05'23"N; 67°01'23"W
47	G	QUARRY Rd.2 20S05	234 35 NW	324 35 SW	N TOP TO N	21, 020			18°05'23"N; 67°01'23"W
48	G	BEACH 22S05	246 78 SE	271 81 SW	LL	04, 245			18°09'48"N; 67°11'07"W
49	G	BEACH 22S05	248 77 NW	268 72 NW	LL	16, 252			18°09'48"N; 67°11'07"W
50	G	BEACH 22S05	267 87 SE	199 90	LL	01, 087			18°09'48"N; 67°11'07"W
51	G	BEACH 22S05	275 83 NE	322 85 SW	LL	13, 093			18°09'48"N; 67°11'07"W
52	G	BEACH 23S05	257 80 NW		?			CUTS F79	18°09'45"N; 67°11'05"W
53	G	BEACH 23S05	324 89 NE		?				18°09'45"N; 67°11'05"W
54	G	BEACH 23S05	275 75 NE	175 80 NE	LL	07, 277			18°09'45"N; 67°11'05"W
55	G	BEACH 23S05	275 75 NE	175 80 NE	LL	07, 277			18°09'45"N; 67°11'05"W
56	G	BEACH 23S05	261 80 SE		?				18°09'45"N; 67°11'05"W
57	G	OFF Rd.311 18S05	261 48 NW	285 67 NE	R	26, 055		CUTS SH58??	18°07'35"N; 67°09'13"W
58	G	OFF Rd.311 18S05	272 40 NE	286 80 NE	R	37, 028			18°07'35"N; 67°09'13"W
59	G	OFF Rd.311 18S05	296 53 NE	312 90	R	46, 064			18°07'35"N; 67°09'13"W
60	G	OFF Rd.311 18S05	282 53 NE	302 77 NE	R	37, 068			18°07'35"N; 67°09'13"W
61	G	Rd. 2 25S05	262 43 NW		?				18°05'58"N; 67°02'42"W

62	G	BEACH 26S05	237 60 NW		?				18°09'36"N; 67°10'59"W

Shear Zones in Serpentinite SB 2005

#	B	Location	C	S	Sense	slip dir.	Stri.	Comments	GPS
1	G	Coast	043, 87 NW	270, 71 N	LL	23, 224			18°9'59"N; 67°11'3"W
2	G	Coast	255, 78 SE	307, 90	LL	09, 253		10' away from #1	
3	G	Coast	335, 90	322, variable	RL			fol. blocks w. sheared matrix	18°9'52"N; 67°11'8"W
4	G	El Hoyo	330, 81 NE	290, 69 SW	LL	38, 337			18°4'54"N; 67°4'44"W
5	G	El Hoyo	270, 77 N	294, 89 NE	LL	24, 084			18°4'54"N; 67°4'44"W
6	G	El Hoyo	285, 84 SW	304, 76 SW	LL	24, 108			18°4'54"N; 67°4'44"W
7	G	El Hoyo	265, 85 SE	284, 86 SW	LL	02, 265			18°4'54"N; 67°4'44"W
8	G	El Hoyo	273, 71 NE	299, 81 NE	LL	17, 087			18°4'54"N; 67°4'44"W
9	G	El Hoyo	255, 87 NW	305, 82 NE	LL	07, 256			18°4'54"N; 67°4'44"W
10	G	El Hoyo	256, 79 SE	293, 78 SW	LL	05, 077			18°4'54"N; 67°4'44"W
11	G	El Hoyo	267, 89 NW	306, 85 SW	LL	09, 087			18°4'54"N; 67°4'44"W
12	G	El Hoyo	260, 75 SE	294, 84 SW	LL	11, 257			18°4'54"N; 67°4'44"W
13	G	El Hoyo	280, 89 NE	307, 82 NE	LL	15, 280			18°4'54"N; 67°4'44"W
14	G	El Hoyo	295, 79 NE	328, 60 SW	T	52, 101			18°4'54"N; 67°4'44"W
15	G	Rd#2 Construction	293, 66 NE		Top to SE				18°6'5"N; 67°2'43"W
16	G	Rd#2 Construction	280, 45 SW		Top to SE			telephone pole site	18°6'5"N; 67°2'43"W
17	G	Rd#2 Construction	280, 60 SW		Top to NW			intrusion int w Rd119	18°6'5"N; 67°2'43"W
18	G	Rd314 S off Rd 102	297, 20 NE	319, 74 NE	Top to SW	19, 054			
19	G	Rd314 S off Rd 102	309, 86 NE	345, 78 NE	LL	14, 310		near contact with SG	
20	G	Rd314 S off Rd 102	302, 87 SW		LL?			anastomosin g	
21	G	Rd314 S off Rd 102	282, 83 SW		LL				
22	G	Rd314 S off Rd 102	285, 79 SW	280, 45 SW	LL	78, 225			
23	G	Rd314 S off Rd 102	290, 68 SW		LL		17, 118; 17, 108	slicks on C plane	
25	G	Road 100	055, 55 SE	291, 68 SW	Top to	00, 235			18°7'44"N; 67°9'34"W

					NE				
26	G	Road 100	055, 45 SE		CW shear				18°7'44"N; 67°9'34"W
27	G	Road 100	305, 60 NE	276, 80 NE	Top to S	26, 322			18°7'44"N; 67°9'34"W
28	G	Road 100	310, 90						18°7'44"N; 67°9'34"W
29	G	Road 100	333, 90					axial surface 335, 75 NE	18°7'44"N; 67°9'34"W
30	G	Schoolbus Quarry	232, 21 NW	212, 48 NW	Top to S		18, 344	slicks on C plane	
31	ME	Rd365 N of SG town	072, 25 NW	015, 68 NW	Top to S			m. wide; cuts SS 7 and 8 ?	18°4'42"N; 66°56'27"W
32	ME	Rd371 N of Yauco	310, 48 NE	310, 76 NE	Top to SW			near contact with Yauco Fm.	18°4'56"N; 66°53'17"W
33	ME	Yauco Quarry Rd368	225, 44 NW						
34	ME	Yauco Quarry Rd368	288, 77 NE						
35	ME	Yauco Quarry Rd368	241, 16 NW						
36	ME	Yauco Quarry Rd368	277, 28 NE						
37	ME	Yauco Quarry Rd368	330, 34 NE						
38	ME	Yauco Quarry Rd368	000, 00						
39	ME	Yauco Quarry Rd368	000, 00						
40	ME	Yauco Quarry Rd368	000, 21 W						

A.2 FAULT DATA

Faults in Serpentinite 2006							
#	B.	Location	Orientation	Striations	Sense	Comments	GPS
1	ME	Rd 119 01SP06	342, 25 SW		?		18°9'1"N; 67°2'11"W
2	ME	Rd 119 01SP06	286, 58 NE		?		18°9'1"N; 67°2'11"W
3	ME	Rd 119 01SP06	273, 30 NE		?		18°9'1"N; 67°2'11"W
4	ME	Rd 119 03SP06	312, 70 NE	12, 125	RL		18°9'38"N; 67°1'49"W
5	ME	Rd 119 03SP06	236, 20 SE	12, 190	T	OLD	18°9'38"N; 67°1'49"W
				21, 148	N	YOUNG	18°9'38"N; 67°1'49"W
6	ME	Rd 119 03SP06	236, 29 NW	01, 234	LL?		18°9'38"N; 67°1'49"W
7	ME	Rd 119 03SP06	290, 40 NE	36, 003	N?		18°9'38"N; 67°1'49"W
8	ME	Rd 119 03SP06	292, 82 NE	06, 289	RL		18°9'38"N; 67°1'49"W
9	ME	Rd 119 03SP06	269, 47 NW	45, 002	N??		18°9'38"N; 67°1'49"W
10	ME	Rd 362 04SP06	348, 66 SW	33, 177	RL??		18°7'13"N; 66°59'30"W
11	ME	Rd 362 04SP06	271, 68 S	43, 121	N		18°7'13"N; 66°59'30"W
12	ME	Rd 362 04SP06	263, 50 S	35, 132	N		18°7'13"N; 66°59'30"W
13	ME	Rd 362 04SP06	248, 44 SE	43, 153	N		18°7'13"N; 66°59'30"W
14	ME	Rd 362 04SP06	344, 55 SW		?		18°7'13"N; 66°59'30"W
15	ME	Rd 362 04SP06	240, 33 SE	31, 124	N??		18°7'13"N; 66°59'30"W
16	ME	Rd 362 04SP06	177, 72 NE	55, 151	N??		18°7'13"N; 66°59'30"W
17	ME	Rd 362 04SP06	345, 54 SW	08, 172	?		18°7'13"N; 66°59'30"W
18	ME	Rd 362 04SP06	234, 48 SE		?		18°7'13"N; 66°59'30"W
19	ME	Rd 362 05SP06	340, 77 SW		?		18°7'14"N; 66°59'23"W
20	ME	Rd 362 10SP06	336, 90	88, 336	WEST SIDE UP		18°7'45"N; 66°59'6"W
21	ME	Rd 362 10SP06	210, 65 SE	65, 152	N?		18°7'45"N; 66°59'6"W
22	ME	Rd 120 12SP06	255, 73 NW	03, 258	RL	0.5 cm thick	18°8'18"N; 66°57'26"W
23	ME	Rd 120 12SP06	273, 56 NE	04, 093	RL	0.5 cm thick	18°8'18"N; 66°57'26"W
24	ME	Rd 120 12SP06	249, 60 SE	40, 112	R??	0.5 cm thick	18°8'18"N; 66°57'26"W
25	ME	Rd 120 12SP06	248, 69 NW	04, 249	RL??		18°8'18"N; 66°57'26"W
26	ME	Rd 120 13SP06	253, 47 SE		?	0.5 m thick	18°8'27"N; 66°57'34"W
27	ME	Rd 120 15SP06	353, 40 SW		N		18°8'38"N; 66°58'4"W

28	ME	Rd 120 15SP06	111, 48 NE	43, 045	?		18°8'38"N; 66°58'4"W
29	ME	Rd 120 15SP06	318, 46 NE	46, 016	N??		18°8'38"N; 66°58'4"W
30	ME	Rd 120 15SP06	294, 51 NE	45, 008	N??		18°8'38"N; 66°58'4"W
31	ME	Rd 120 15SP06	307, 61 SW	54, 250	N		18°8'38"N; 66°58'4"W
32	ME	Rd 120 15SP06	279, 64 NE	64, 004	N	OLD	18°8'38"N; 66°58'4"W
				31, 296	LL-N	YOUNG	
33	ME	Rd 120 15SP06	347, 55 SW	55, 257	R		18°8'38"N; 66°58'4"W
34	ME	Rd 120 15SP06	325, 53 NE	56, 028	N		18°8'38"N; 66°58'4"W
35	ME	Rd 120 15SP06	179, 64 NE		?		18°8'38"N; 66°58'4"W
36	ME	Rd 119 16SP06	279, 48 NE	48, 009	N??	FAULT BRECCIA	18°9'21"N; 67°2'7"W
37	ME	Rd 119 16SP06	111, 42 NE	18, 096	?		18°9'21"N; 67°2'7"W
38	ME	Rd 119 16SP06	281, 64 NE	55, 324	N		18°9'21"N; 67°2'7"W
39	ME	Rd 119 16SP06	227, 67 SE	10, 223	RL??		18°9'21"N; 67°2'7"W
40	ME	Rd 119 16SP06	211, 43 SE	04, 039	RL		18°9'21"N; 67°2'7"W
41	ME	Rd 119 17SP06	323, 81 NE	81, 035	N		18°9'37"N; 67°2'13"W
42	ME	Rd 119 17SP06	262, 47 NW	47, 326	N?		18°9'37"N; 67°2'13"W
43	ME	Rd 119 17SP06	298, 50 NE	48, 026	R??		18°9'37"N; 67°2'13"W
44	ME	Rd 119 18SP06	206, 43 NW		?		18°9'42"N; 67°1'56"W
45	ME	Rd 119 18SP06	191, 55 NW	48, 020	?		18°9'42"N; 67°1'56"W
46	ME	Rd 119 18SP06	173, 42 SW	41, 280	?		18°9'42"N; 67°1'56"W
47	ME	Rd 119 18SP06	287, 74 SW	32, 276		OLD	18°9'42"N; 67°1'56"W
				17, 121		YOUNG	18°9'42"N; 67°1'56"W
				54, 130	R??	YOUNGEST	18°9'42"N; 67°1'56"W
48	ME	Rd 119 18SP06	252, 52 NW		?	30 CM THICK, FAULT BRECCIA	18°9'42"N; 67°1'56"W
49	ME	Rd 119 18SP06	223, 84 NW		?		18°9'42"N; 67°1'56"W
50	ME	Rd 119 19SP06	288, 87 NE	84, 077	R	5 CM THICK	18°9'38"N; 67°1'53"W
51	ME	Rd 119 19SP06	233, 72 NW	04, 235	LL??	OLD CUTS F50	18°9'38"N; 67°1'53"W
				57, 023	?	YOUNG	
52	ME	Rd 119 19SP06	326, 68 SW	37, 163	LL??		18°9'38"N; 67°1'53"W
53	ME	Rd 119 19SP06	227, 55 SE	34, 121	?		18°9'38"N; 67°1'53"W
54	ME	Rd 119 22SP06	296, 72 NE	33, 092	R?		18°9'10"N; 67°2'23"W
55	ME	Rd 119 22SP06	301, 62 NE	33, 101	LL-R??	GOUGE	18°9'10"N; 67°2'23"W

56	ME	Rd 119 22SP06	255, 39 NW		?		18°9'10"N; 67°2'23"W
57	ME	Rd 119 22SP06	295, 87 NE	SHALLOW		1 M THICK	18°9'10"N; 67°2'23"W
58	ME	Rd 120 23SP06	294, 54 NE		?		18°6'3"N; 66°57'33"W
59	ME	Rd 120 23SP06	299, 38 SW		?	CUTS F58	18°6'3"N; 66°57'33"W
60	ME	Rd 120 23SP06	260, 58 SE	57, 155	?	10 CM THICK	18°6'3"N; 66°57'33"W
				08, 255	?		
61	ME	Rd 120 25SP06	228, 41 SE		?		18°6'21"N; 66°57'23"W
62	ME	Rd 120 25SP06	204, 40 SE		?		18°6'21"N; 66°57'23"W
63	ME	Rd 120 26SP06	250, 63 NW	16, 058	?		18°6'25"N; 66°57'23"W
64	ME			51, 291	?		
65	ME	Rd 120 26SP06	246, 75 NW	10, 063	?		18°6'25"N; 66°57'23"W
66				63, 277	?		
67	ME	Rd 120 26SP06	272, 51 NE	37, 304	R???		18°6'25"N; 66°57'23"W
68	ME	Rd 120 26SP06	283, 90		?	MAP IT	18°6'26"N; 66°57'23"W
69	ME	Rd 120 27SP06	296, 86 SW	76, 132	N??		18°6'29"N; 66°57'25"W
70	ME	Rd 120 29SP06	258, 67 NW	63, 350	R?		18°6'32"N; 66°57'24"W
71	ME	Rd 120 29SP06	236, 63 NW	62, 313	?		18°6'32"N; 66°57'24"W
72	ME	Rd 120 29SP06	250, 25 NW	16, 261	?		18°6'32"N; 66°57'24"W
73				25, 350	R??		
74	ME	Rd 120 29SP06	327, 86 NE	13, 328	?	SMALL	18°6'32"N; 66°57'24"W
75	ME	Rd 120 30SP06	267, 72 NW	30, 286	LL		18°6'37"N; 66°57'23"W
76	ME	Rd 120 30SP06	292, 52 SW	52, 202	N??		18°6'37"N; 66°57'23"W
77	ME	Rd 120 30SP06	350, 67 NE	01, 170	RL?		18°6'37"N; 66°57'23"W
78	ME	Rd 120 30SP06	271, 16 SW	12, 111	RL TOP TO W	CUTS F77 OFFSET OF 6.5 CM	18°6'37"N; 66°57'23"W
79	ME	Rd 120 31SP06	332, 80 NE	23, 332	RL?		18°6'39"N; 66°57'20"W
80	ME	Rd 120 33SP06	175, 19 SW	07, 335	?		18°6'43"N; 66°57'17"W
81	ME	Rd 120 33SP06	184, 41 NW	36, 309	?		18°6'43"N; 66°57'17"W
				09, 354	?		
82	ME	Rd 120 40SP06	183, 70 NW		?	SMALL	18°7'43"N; 66°57'22"W
83	ME	Rd 120 41SP06	276, 45 NE		?		18°7'41"N; 66°57'12"W
84	ME	Rd 120 41SP06	309, 53 NE		?		18°7'41"N; 66°57'12"W
85	ME	Rd 120 43SP06	314, 88 NE	49, 316	?		18°7'32"N; 66°57'13"W

86	ME	Rd 120 43SP06	302, 90	58, 305	RL?		18°7'32"N; 66°57'13"W
87	ME	Rd 120 44SP06	256, 65 NW	31, 60	N-RL		18°7'21"N; 66°57'1"W
89	ME	Rd 120 48SP06	266, 64 NW	64, 354	N	2 CM THICK	18°7'27"N; 66°57'09"W
90	ME	Rd 120 48SP06	223, 86 NW	45, 223	LL		18°7'27"N; 66°57'09"W
91	ME	Rd 120 48SP06	040, 73 SE	41, 209	LL		18°7'27"N; 66°57'09"W
92	ME	Rd 120 50SP06	198, 42 SE	26, 142	N		18°8'21"N; 66°57'30"W
93	ME	Rd 120 53SP06	160, 70 SW	49, 184	N?		18°8'37"N; 66°58'5"W
94	ME	Rd 120 53SP06	288, 90	47, 110	LL		18°8'37"N; 66°58'5"W
95	ME	Rd 120 53SP06	300, 90	43, 125	LL	CUTS F96	18°8'37"N; 66°58'5"W
96	ME	Rd 120 53SP06	223, 32 NW	12, 227	?		18°8'37"N; 66°58'5"W
97	ME	Rd 120 53SP06	330, 72 SW		R	CUTS FS53	18°8'37"N; 66°58'5"W
98	ME	Rd 120 53SP06	314, 84 NE	83, 078	N		18°8'37"N; 66°58'5"W
99	ME	Rd 120 53SP06	320, 76 NE	52, 125	N?		18°8'37"N; 66°58'5"W
100	ME	Rd 120 53SP06	276, 26 NE	10, 058	T TOP TO SW		18°8'37"N; 66°58'5"W
101	ME	Rd 120 53SP06	258, 58 NW	25, 060			18°8'37"N; 66°58'5"W
102	ME	Rd 120 53SP06	322, 63 NE		N?? TOP TO NE		18°8'37"N; 66°58'5"W
103	ME	Rd 120 54SP06	330, 67 SW	07, 327	?		18°8'36"N; 66°58'7"W
104	ME	Rd 120 54SP06	289, 54 SW	09, 275	LL	OLD	18°8'36"N; 66°58'7"W
				20, 122	TOP TO SE	YOUNG	
105	ME	Rd 120 54SP06	266, 44 SE	19, 113	R? TOP TO NW		18°8'36"N; 66°58'7"W
106	ME	Rd 120 54SP06	213, 59 SE	45, 177		CUTS SH93	18°8'36"N; 66°58'7"W
107	ME	Rd 120 54SP06	135, 40 SW	47, 238	N??		18°8'36"N; 66°58'7"W
108	ME	Rd 120 55SP06	245, 18 NW		?		18°8'34"N; 66°58'9"W
109	ME	Rd 120 55SP06	275, 16 SE		?		18°8'34"N; 66°58'9"W
110	ME	Rd 120 55SP06	216, 09 NW		?		18°8'34"N; 66°58'9"W
111	ME	Rd 120 56SP06	231, 22 SE		N??	CUTS FS62	18°8'30"N; 66°58'12"W
112	ME	Rd 120 56SP06	315, 62 NE		N	CUTS FH7	18°8'30"N; 66°58'12"W
113	ME	Rd 120 57SP06	250, 50 NW	30, 051	R??		18°8'28"N; 66°58'14"W
114	ME	Rd 120 58SP06	205, 28 NW	11, 221	R?? TOP TO E		18°8'29"N; 66°58'29"W
115	ME	Rd 120 58SP06	202, 32 NW	26, 254	R TOP TO E		18°8'29"N; 66°58'29"W
116	ME	Rd 120 60SP06	310, 50 NE		N	CUTS SH109 ; OFFSET 7 CM	18°8'58"N; 66°58'55"W
117	ME	Rd 120 61SP06	129, 30 SW	30, 213	T	1.2 M THICK	18°8'52"N; 66°59'7"W
118	ME	Rd 120 61SP06	240, 40 NW	17, 010?	?	CUTS F119?	18°8'52"N; 66°59'7"W

119	ME	Rd 120 61SP06	266, 75 NW	16, 084	LL		18°8'52"N; 66°59'7"W
120	ME	Rd 120 61SP06	194, 67 SE	23, 205	?		18°8'52"N; 66°59'7"W
121	ME	Rd 120 61SP06	211, 81 SE	38, 206	RL		18°8'52"N; 66°59'7"W
122	ME	Rd 120 61SP06	255, 47 NW	26, 290	TOP TO SE		18°8'52"N; 66°59'7"W
123	ME	Rd 120 61SP06	199, 60 NW	20, 209	RL		18°8'52"N; 66°59'7"W
124	ME	Rd 120 61SP06	189, 38 NW	18, 208	N-LL? TOP TO SW		18°8'52"N; 66°59'7"W
125	ME	Rd 120 61SP06	339, 70 SW	12, 162	LL	YOUNG	18°8'52"N; 66°59'7"W
				33, 170	LL TOP TO S	OLD	
126	ME	Rd 120 61SP06	265, 54 NW	25, 285	RL?	YOUNG	18°8'52"N; 66°59'7"W
				54, 353	N??	OLD	
127	ME	Rd 120 62SP06	195, 38 SE	16, 022	LL??	7 CM THICK; CUTS F128; OLD	18°8'54"N; 66°59'9"W
				31, 096	N?	YOUNG	
128	ME	Rd 120 62SP06	235, 82 NW	14, 224	LL		18°8'54"N; 66°59'9"W
129	ME	Rd 120 63SP06	311, 38 NE	03, 127	LL?		18°8'56"N; 66°59'14"W
130	ME	Rd 120 63SP06	087, 35 NW	08, 080	LL	CUTS FS71	18°8'56"N; 66°59'14"W
131	ME	Rd 120 63SP06	335, 38 NE		R TOP TO NW	BASED ON DRAG FOLIATION	18°8'56"N; 66°59'14"W
132	ME	Rd 120 63SP06	169, 53 NE	34, 138	N TOP TO SE		18°8'56"N; 66°59'19"W
133	ME	Rd 120 63SP06	257, 26 NW	00, 012	R TOP TO SW		18°8'56"N; 66°59'19"W
134	ME	Rd 120 63SP06	325, 65 SW	36, 175	?		18°8'56"N; 66°59'19"W
				60, 197	N		
135	ME	Rd 120 64SP06	079, 37 NW	37, 026	R		18°8'53"N; 66°59'23"W
136	ME	Rd 120 64SP06	335, 42 NE	20, 132	?	STRIAE CURVED	18°8'53"N; 66°59'23"W
137	ME	Rd 120 65SP06	280, 80 NE	41, 085	LL		18°9'6"N; 66°59'38"W
138	ME	Rd 120 65SP06	272, 71 NE	17, 100	LL		18°9'6"N; 66°59'38"W
139	ME	Rd 120 66SP06	348, 37 NE	02, 171	RL	CUTS FS75	18°9'12"N; 66°59'40"W
140	ME	Rd 120 67SP06	240, 49 NW	28, 323	N??	5 CM THICK; CUTS F141	18°9'16"N; 66°59'43"W
141	ME	Rd 120 67SP06	222, 80 SE	09, 220	LL?		18°9'16"N; 66°59'43"W
142	ME	Rd 120 67SP06	198, 72 NW	36, 208	RL		18°9'16"N; 66°59'43"W
143	ME	Rd 120 67SP06	280, 54 SW		?		18°9'16"N; 66°59'43"W
144	ME	Rd 120 68SP06	350, 74 NE	02, 350	RL?		18°9'18"N; 66°59'45"W

145	ME	Rd 120 68SP06	000, 39 E	14, 188	RL?		18°9'18"N; 66°59'45"W
146	ME	Rd 120 68SP06	259, 43 NW		?		18°9'18"N; 66°59'45"W
147	ME	Rd 120 68SP06	267, 60 NW	60, 353	?		18°9'18"N; 66°59'45"W
148	ME	Rd 120 68SP06	195, 85 SE	18, 015	RL?	CUTS F147	18°9'18"N; 66°59'45"W
149	ME	Rd 120 68SP06	174, 58 NE	44, 111	?		18°9'18"N; 66°59'45"W
150	ME	Rd 120 69SP06	255, 74 SE	32, 240	?		18°9'20"N; 66°59'53"W
151	ME	Rd 120 70SP06	324, 75 NE	28, 340	RL		18°9'22"N; 66°59'53"W
152	ME	Rd 120 70SP06	200, 55 NW	40, 222	N?	OLD	18°9'22"N; 66°59'53"W
				54, 270	N??	YOUNG	
				19, 202	R?	YOUNG	
153	ME	Rd 120 70SP06	282, 22 NE	19, 006	R??		18°9'22"N; 66°59'53"W
154	ME	Rd 120 70SP06	194, 60 SE	09, 185	RL		18°9'22"N; 66°59'53"W
				40, 100	N		
155	ME	Rd 120 70SP06	195, 56 SE	14, 013	RL		18°9'22"N; 66°59'53"W
156	ME	Rd 120 70SP06	196, 76 NW	55, 216	R		18°9'22"N; 66°59'53"W
157	ME	Rd 120 70SP06	323, 65 SW	65, 231	R		18°9'22"N; 66°59'53"W
158	ME	Rd 120 70SP06	189, 54 NW	08, 003	RL??	CUTS F 158 AND SH126; CURVES	18°9'22"N; 66°59'53"W
159	ME	Rd 120 70SP06	260, 20 SE	10, 230	N?? TOP TO SW		18°9'22"N; 66°59'53"W
				01, 071	R TOP TO SW		
160	ME	Rd 120 70SP06	254, 33 SE	10, 087	R? TOP TO W		18°9'22"N; 66°59'53"W
161	ME	Rd 120 70SP06	272, 42 SW		?	SERP. BRECCIA	18°9'22"N; 66°59'53"W
162	ME	Rd 120 70SP06	287, 57 SW		?	CUTS F163	18°9'22"N; 66°59'53"W
163	ME	Rd 120 70SP06	274, 40 NE	10, 302	LL TOP TO NW		18°9'22"N; 66°59'53"W
164	ME	Rd 120 70SP06	246, 81 SE	35, 243	LL		18°9'22"N; 66°59'53"W
165	ME	Rd 120 70SP06	300, 56 SW		?	5 CM THICK	18°9'22"N; 66°59'53"W
166	ME	Rd 120 70SP06	304, 38 SW		?	SERP. BRECCIA	18°9'22"N; 66°59'53"W
167	ME	Rd 120 70SP06	320, 28 SW	26, 259	?		18°9'22"N; 66°59'53"W
168	ME	Rd 120 70SP06	230, 33 NW	28, 270	N		18°9'22"N; 66°59'53"W
169	ME	Rd 120 70SP06	332, 41 SW	12, 325	LL		18°9'22"N; 66°59'53"W
170	ME	Rd 120 70SP06	195, 62 NW	40, 348	?		18°9'22"N; 66°59'53"W
171	ME	Rd 120 70SP06	278, 54 SW	33, 249	?	CUTS F170	18°9'22"N; 66°59'53"W

172	ME	Rd 120 70SP06	288, 64 SW	42, 243	?		18°9'22"N; 66°59'53"W
173	ME	Rd 120 71SP06	301, 89 NE	26, 294	LL??		18°9'25"N; 66°59'54"W
174	ME	Rd 120 71SP06	349, 88 NE		?	20 CM THICK; PHACOIDS, BRECCIA	18°9'25"N; 66°59'54"W
175	ME	Rd 120 71SP06	191, 87 SE	23, 190	RL??		18°9'25"N; 66°59'54"W
				39, 013	?		
176	ME	Rd 120 72SP06	241, 44 SE		?	CONTACT MASSIVE BRECCIA SERP.	18°9'27"N; 66°59'56"W
177	ME	Rd 120 72SP06	291, 47 SW		?	CUTS FS89	18°9'27"N; 66°59'56"W
178	ME	Rd 120 72SP06	240, 85 SE	06, 056	?		18°9'27"N; 66°59'56"W
179	ME	Rd 120 72SP06	302, 71 SW	20, 140	?		18°9'27"N; 66°59'56"W
180	ME	Rd 120 72SP06	230, 54 NW	55, 312	R??	CUTS F179	18°9'27"N; 66°59'56"W
181	ME	Rd 120 72SP06	202, 85 SE	23, 024	?		18°9'28"N; 66°59'56"W
182	ME	Rd 120 73SP06	276, 48 SW	33, 145	?		18°9'29"N; 66°59'57"W
183	ME	Rd 120 73SP06	275, 90		?	CUTS F182	18°9'29"N; 66°59'57"W
184	ME	Rd 120 73SP06	274, 81 SW	60, 150	?		18°9'29"N; 66°59'57"W
185	ME	Rd 120 73SP06	260, 84 SE		?		18°9'29"N; 66°59'57"W
186	ME	Rd 120 73SP06	253, 84 SE	62, 253	TOP TO E		18°9'29"N; 66°59'57"W
187	ME	Rd 120 73SP06	224, 64 SE	50, 062	?		18°9'29"N; 66°59'57"W
188	ME	Rd 120 73SP06	236, 90	14, 238	LL	CUTS SH139	18°9'29"N; 66°59'57"W
189	ME	Rd 120 73SP06	169, 68 NE	01, 358	RL???	CUTS SH139	18°9'29"N; 66°59'57"W
190	ME	Rd 120 73SP06	284, 58 SW	30, 119	RL?	CUTS SH141	18°9'29"N; 66°59'57"W
191	ME	Rd 120 73SP06	240, 70 SE		?		18°9'29"N; 66°59'57"W
192	ME	Rd 120 73SP06	238, 31 NW	10, 028	TOP TO SW	CUTS D2	18°9'29"N; 66°59'57"W
193	ME	Rd 120 73SP06	248, 42 NW	31, 025	?	CUTS D4	18°9'29"N; 66°59'57"W
194	ME	Rd 120 73SP06	320, 50 NE	37, 011	R		18°9'29"N; 66°59'57"W
195	ME	Rd 120 73SP06	315, 63 SW	00, 140	RL		18°9'29"N; 66°59'57"W
196	ME	Rd 120 73SP06	253, 35 NW	10, 062	?		18°9'29"N; 66°59'57"W
197	ME	Rd 120 73SP06	080, 87 SE	41, 255	R-LL		18°9'29"N; 66°59'57"W
199	ME	Rd 120 74SP06	320, 83 SW	32, 138	?		18°9'34"N; 66°59'58"W
200	ME	Rd 120 74SP06	312, 72 SW		?		18°9'34"N; 66°59'58"W
201	ME	Rd 120 74SP06	326, 68 SW	52, 177	?	CUTS F200	18°9'34"N; 66°59'58"W
202	ME	Rd 120 74SP06	182, 78 NW	22, 184	RL		18°9'34"N; 66°59'58"W

203	ME	Rd 120 74SP06	172, 54 SW	45, 210	R		18°9'34"N; 66°59'58"W
204	ME	Rd 120 74SP06	245, 50 NW	02, 240	RL	CUTS F203 AND F202	18°9'34"N; 66°59'58"W
205	ME	Rd 120 75SP06	205, 47 NW	06, 211	?		18°9'37"N; 66°59'57"W
206	ME	Rd 120 75SP06	287, 90		?	20 CM THICK BRECCIA	18°9'37"N; 66°59'57"W
207	ME	Rd 120 75SP06	200, 21 NW	15, 358	RL TOP TO NE		18°9'37"N; 66°59'57"W
208	ME	Rd 120 75SP06	320, 21 NE	18, 062	R TOP TO SW		18°9'37"N; 66°59'57"W
209	ME	Rd 120 75SP06	247, 82 SE	70, 246	?	CUTS SH154	18°9'37"N; 66°59'57"W
210	ME	Rd 120 75SP06	255, 54 NW	SHALLOW	?		18°9'37"N; 66°59'57"W
211	ME	Rd 120 76SP06	350, 89 SW	28, 006	RL		18°9'40"N; 66°59'50"W
212	ME	Rd 120 76SP06	340, 83 NE	32, 349	RL		18°9'40"N; 66°59'50"W
213	ME	Rd 120 76SP06	289, 64 NE	31, 306	?	CUTS F211, F212, SH155	18°9'40"N; 66°59'50"W
214	ME	Rd 120 76SP06	281, 60 SW		?		18°9'40"N; 66°59'50"W
215	ME	Rd 120 76SP06	132, 72 NE		?		18°9'40"N; 66°59'50"W
216	ME	Rd 120 77SP06	276, 67 SW	36, 258	?		18°9'42"N; 66°59'47"W
217	ME	Rd 120 78SP06	303, 87 NE	22, 095	RL??		18°9'43"N; 66°59'43"W
218	ME	Rd 120 78SP06	142, 31SW	10, 038	?		18°9'43"N; 66°59'43"W
219	ME	Rd 120 78SP06	238, 80 NW	SHALLOW	?		18°9'43"N; 66°59'43"W
220	ME	Rd 120 78SP06	282, 86 SW	39, 105	RL??		18°9'43"N; 66°59'43"W
221	ME	Rd 120 78SP06	313, 69 SW	52, 206	N??		18°9'43"N; 66°59'43"W
222	ME	Rd 120 78SP06	276, 76 SW	20, 101	LL?		18°9'43"N; 66°59'43"W
223	ME	Rd 120 78SP06	132, 68 SW	75, 194	N	CUTS F224	18°9'43"N; 66°59'43"W
224	ME	Rd 120 78SP06	336, 62 NE		?		18°9'43"N; 66°59'43"W
225	ME	Rd 120 79SP06	329, 61 SW	20, 318	?		18°9'47"N; 66°59'41"W
226	ME	Rd 120 79SP06	286, 40 NE	36, 351	?		18°9'47"N; 66°59'41"W
227	ME	Rd 120 79SP06	324, 88 NE	15, 332	RL		18°9'47"N; 66°59'41"W
228	ME	Rd 120 79SP06	215, 43 NW	43, 279	N		18°9'47"N; 66°59'41"W
229	ME	Rd 120 79SP06	285, 72 NE	42, 291	?		18°9'47"N; 66°59'41"W
230	ME	Rd 120 79SP06	200, 54 NW	44, 308	N		18°9'47"N; 66°59'41"W
231	ME	Rd 120 79SP06	305, 38 NE		?		18°9'47"N; 66°59'41"W
232	ME	Rd 120 79SP06	241, 54 NW	30, 011	?		18°9'47"N; 66°59'41"W
233	ME	Rd 120 79SP06	285, 84 SW		?		18°9'47"N; 66°59'41"W
234	ME	Rd 120 79SP06	250, 60 NW	60, 314	N		18°9'47"N; 66°59'41"W

235	ME	Rd 120 79SP06	255, 40 SE		?		18°9'47"N; 66°59'41"W
236	ME	Rd 120 79SP06	249, 45 SE		?		18°9'47"N; 66°59'41"W
237	ME	Rd 120 79SP06	225, 60 SE	08, 253	LL??		18°9'47"N; 66°59'41"W
238	ME	Rd 120 79SP06	172, 53 SW	40, 307	N? TOP TO NW		18°9'47"N; 66°59'41"W
239	ME	Rd 120 79SP06	264, 32 SE	32, 150	R??		18°9'47"N; 66°59'41"W
				32, 171	N??		
240	ME	Rd 120 79SP06	222, 80 SE	07, 213	RL??		18°9'47"N; 66°59'41"W
241	ME	Rd 120 79SP06	292, 20 NE	19, 000	?		18°9'47"N; 66°59'41"W
242	ME	Rd 120 79SP06	254, 34 NW	34, 350	R		18°9'47"N; 66°59'41"W
243	ME	Rd 120 80SP06	272, 65 NE	07, 272	?		18°9'55"N; 66°59'42"W
244	ME	Rd 120 80SP06	253, 64 NW	18, 260	LL		18°9'55"N; 66°59'42"W
245	ME	Rd 120 80SP06	308, 45 NE	25, 011	?		18°9'55"N; 66°59'42"W
246	ME	Rd 120 80SP06	295, 90		?	CUTS F247??	18°9'55"N; 66°59'42"W
247	ME	Rd 120 80SP06	282, 33 NE	12, 302	N		18°9'55"N; 66°59'42"W
248	ME	Rd 120 80SP06	265, 42 NW		?		18°9'55"N; 66°59'42"W
249	ME	Rd 120 80SP06	282, 42 NE	42, 026	?		18°9'55"N; 66°59'42"W
250	ME	Rd 120 80SP06	245, 59 NW	56, 306	N?		18°9'55"N; 66°59'42"W
251	ME	Rd 120 80SP06	255, 83 NW	83, 331	N?		18°9'55"N; 66°59'42"W
252	ME	Rd 120 81SP06	322, 50 NE	50, 067	N		18°10'1"N; 66°59'36"W
253	ME	Rd 120 81SP06	320, 57 NE	57, 071	N		18°10'1"N; 66°59'36"W
254	ME	Rd 120 81SP06	306, 76 SW	70, 170	N		18°10'1"N; 66°59'36"W
				36, 136	RL??		
255	ME	Rd 120 81SP06	238, 78 SE		?		18°10'1"N; 66°59'36"W
256	ME	Rd 120 82SP06	314, 72 SW	58, 183	R		18°10'3"N; 66°59'35"W
257	ME	Rd 120 82SP06	280, 74 NE	57, 074	N		18°10'3"N; 66°59'35"W
258	ME	Rd 120 82SP06	101, 65 SW		?		18°10'3"N; 66°59'35"W
259	ME	Rd 120 82SP06	335, 78 NE		?		18°10'3"N; 66°59'35"W
260	ME	Rd 120 82SP06	333, 78 SW	48, 158	?		18°10'3"N; 66°59'35"W
261	ME	Rd 120 82SP06	298, 68 SW	64, 234	N		18°10'3"N; 66°59'35"W
262	ME	Rd 120 82SP06	305, 66 SW		?		18°10'3"N; 66°59'35"W
263	ME	Rd 120 82SP06	291, 60 NE	07, 107	LL??	YOUNG?	18°10'3"N; 66°59'35"W
				38, 084	R	OLD?	
264	ME	Rd 120 82SP06	297, 81 NE		?		18°10'3"N; 66°59'35"W

265	ME	Rd 362 83SP06	284, 87 NE	74, 293	?	CUTS F266	18°08'44"N; 66°58'10"W
266	ME	Rd 362 83SP06	316, 25 NE		?		18°08'44"N; 66°58'10"W
267	ME	Rd 362 83SP06	103, 18 NE		?	CUTS F265	18°08'44"N; 66°58'10"W
268	ME	Rd 362 83SP06	335, 82 NE		N TOP TO N	CUTS F267	18°08'44"N; 66°58'10"W
269	ME	Rd 362 83SP06	297, 61 NE	61, 323	R?		18°08'44"N; 66°58'10"W
270	ME	Rd 362 83SP06	230, 78 NE	57, 249	LL		18°08'44"N; 66°58'10"W
271	ME	Rd 362 83SP06	295, 41 SW	41, 227	R	CUTS F272 OFFSET 1.5M	18°08'44"N; 66°58'10"W
272	ME	Rd 362 83SP06	274, 82 NE	23, 277	LL		18°08'44"N; 66°58'10"W
273	ME	Rd 362 83SP06	263, 75 NE	28, 267	LL		18°08'44"N; 66°58'10"W
274	ME	Rd 362 83SP06	292, 80 NE	14, 291	LL		18°08'44"N; 66°58'10"W
275	ME	Rd 362 84SP06	234, 64 NW	23, 045	?	CUTS F276	18°08'31"N; 66°58'17"W
276	ME	Rd 362 84SP06	298, 48 SW	45, 116	?		18°08'31"N; 66°58'17"W
277	ME	Rd 362 84SP06	298, 86 NE	81, 028	N		18°08'31"N; 66°58'17"W
278	ME	Rd 362 84SP06	091, 29 NE		?		18°08'31"N; 66°58'17"W
279	ME	Rd 362 84SP06	268, 62 NW	62, 010	R??		18°08'31"N; 66°58'17"W
280	ME	Rd 362 84SP06	278, 20 SW	20, 226	?		18°08'31"N; 66°58'17"W
281	ME	Rd 362 84SP06	340, 75 SW	02, 340	RL	YOUNG	18°08'31"N; 66°58'17"W
				74, 225	N?	OLD CUTS F283??	
282	ME	Rd 362 84SP06	001, 83 NW	52, 190	RL-R		18°08'31"N; 66°58'17"W
283	ME	Rd 362 84SP06	306, 37 NE	35, 034	R??		18°08'31"N; 66°58'17"W
284	ME	Rd 362 84SP06	323, 31 NE	31, 057	R	CUTS SH200	18°08'31"N; 66°58'17"W
285	ME	Rd 362 84SP06	301, 30 SW	30, 182	R		18°08'31"N; 66°58'17"W
286	ME	Rd 362 84SP06	268, 38 NW	32, 041	R		18°08'31"N; 66°58'17"W
287	ME	Rd 362 84SP06	302, 77 NE	73, 046	R		18°08'31"N; 66°58'17"W
288	ME	Rd 362 84SP06	328, 33 SW	33, 068	?		18°08'31"N; 66°58'17"W
289	ME	Rd 362 84SP06	309, 57 SW	40, 156	N???		18°08'31"N; 66°58'17"W
290	ME	Rd 362 85SP06	310, 70 SW		?	CUTS F291 AND F292	18°08'31"N; 66°58'07"W
291	ME	Rd 362 85SP06	274, 57 NE		?		18°08'31"N; 66°58'07"W
292	ME	Rd 362 85SP06	185, 84 SE	56, 176	?		18°08'31"N; 66°58'07"W
293	ME	Rd 362 85SP06	340, 76 SW	73, 286	N??		18°08'31"N; 66°58'07"W
				34, 330	?		
294	ME	Rd 362 85SP06	317, 70 NE		?		18°08'31"N; 66°58'07"W

295	ME	Rd 362 85SP06	254, 30 NW	30, 302	?		18°08'31"N; 66°58'07"W
296	ME	Rd 362 85SP06	314, 62 SW	31, 289	RL-N		18°08'31"N; 66°58'07"W
297	ME	Rd 362 85SP06	197, 40 NW		?		18°08'31"N; 66°58'07"W
298	ME	Rd 362 85SP06	339, 84 NE	10, 158	RL???		18°08'31"N; 66°58'07"W
299	ME	Rd 362 85SP06	135, 72 SW	STEEP	?		18°08'31"N; 66°58'07"W
300	ME	Rd 362 85SP06	320, 74 SW		?	FAULT BRECCIA	18°08'31"N; 66°58'07"W
301	ME	Rd 362 86SP06	268, 50 NW	50, 003	N		18°08'26"N; 66°58'08"W
302	ME	Rd 362 86SP06	326, 64 SW	58, 280	N	CUTS F301	18°08'26"N; 66°58'08"W
303	ME	Rd 362 86SP06	258, 57 NW	56, 346	?		18°08'26"N; 66°58'08"W
304	ME	Rd 362 86SP06	306, 73 NE	66, 050	N		18°08'26"N; 66°58'08"W
305	ME	Rd 362 86SP06	285, 61 NE	03, 316	RL??		18°08'26"N; 66°58'08"W
306	ME	Rd 362 86SP06	252, 88 NW	06, 072	RL		18°08'26"N; 66°58'08"W
307	ME	Rd 362 86SP06	331, 70 NE	20, 339	RL		18°08'26"N; 66°58'08"W
308	ME	Rd 362 86SP06	275, 20 SW		?		18°08'26"N; 66°58'08"W
309	ME	Rd 362 86SP06	229, 74 SE	23, 232	?	CUTS LOW ANGLE SHEAR ZONES	18°08'26"N; 66°58'08"W
310	ME	Rd 362 86SP06	286, 22 SW	15, 133	N??		18°08'26"N; 66°58'08"W
311	ME	Rd 366 87SP06	260, 37 SE		?		18°08'32"N; 66°57'34"W
312	ME	Rd 366 87SP06	296. 31 SW		R???		18°08'32"N; 66°57'34"W
313	ME	Rd 366 87SP06	267, 85 NW		?		18°08'32"N; 66°57'34"W
314	ME	Rd 366 88SP06	329, 79 SW	39, 156	RL?		18°08'35"N; 66°57'30"W
315	ME	Rd 366 92SP06	325, 54 NE	18, 348	?	CUTS F316 AND F317	18°08'42"N; 66°57'09"W
316	ME	Rd 366 92SP06	340, 86 SW	85, 339	?	CUTS SH226 AND SH227	18°08'42"N; 66°57'09"W
				55, 164	?		
317	ME	Rd 366 92SP06	345, 80 SW	06, 166	?		18°08'42"N; 66°57'09"W
318	ME	Rd 366 92SP06	216, 73 SE	25, 194	RL??		18°08'42"N; 66°57'09"W
319	ME	Rd 366 92SP06	275, 35 NE	35, 327	R		18°08'42"N; 66°57'09"W
320	ME	Rd 366 93SP06	324, 40 NE	33, 016	?		18°08'44"N; 66°57'09"W
321	ME	Rd 366 93SP06	280, 68 SW	14, 106	LL	CUTS F323?	18°08'44"N; 66°57'09"W
322	ME	Rd 366 93SP06	294, 64 SW	57, 218	R??	CUTS F323?	18°08'44"N; 66°57'09"W
323	ME	Rd 366 93SP06	352, 71 NE	36, 150	N		18°08'44"N; 66°57'09"W
324	ME	Rd 366 93SP06	261, 82 NW	02, 081	LL		18°08'44"N; 66°57'09"W

325	ME	Rd 366 93SP06	246, 83 NW	23, 246	LL		18°08'44"N; 66°57'09"W
326	ME	Rd 366 93SP06	301, 30 SW	20, 252	N		18°08'44"N; 66°57'09"W
327	ME	Rd 366 93SP06	314, 54 SW	35, 160	R	CUTS SH232 OFFSET 3.5 CM	18°08'44"N; 66°57'09"W
328	ME	Rd 366 93SP06	330, 78 NE	56, 125	N		18°08'44"N; 66°57'09"W
329	ME	Rd 366 93SP06	295, 64 NE		?	GOUGE	18°08'44"N; 66°57'07"W
330	ME	Rd 366 93SP06	300, 41 NE		?	GOUGE	18°08'44"N; 66°57'07"W
331	ME	Rd 366 93SP06	239, 50 SE	10, 056	LL	CUTS FS155	18°08'44"N; 66°57'07"W
332	ME	Rd 366 93SP06	225, 78 SE	06, 045	LL	CUTS F331	18°08'44"N; 66°57'07"W
333	ME	Rd 366 93SP06	236, 68 SE	58, 104	R		18°08'44"N; 66°57'07"W
334	ME	Rd N OF 366 97SP06	326, 35 NE		?		18°09'00"N; 66°57'04"W
335	ME	Rd N OF 366 98SP06	298, 80 NE	57, 304	LL		18°09'04"N; 66°57'01"W
336	ME	Rd N OF 366 99SP06	250, 73 SE	73, 140	N		18°09'06"N; 66°57'01"W
337	ME	Rd N OF 366 100SP06	299, 80 SW	84, 185	N	CUTS SH245-248 AND FS174-176	18°09'08"N; 66°57'00"W
338	ME	Rd N OF 366 100SP06	262, 64 NW	55, 023	N		18°09'08"N; 66°57'00"W
339	ME	Rd 365 103SP06	230, 42 NW	38, 350	N	CUTS F341	18°06'15"N; 66°55'17"W
340	ME	Rd 365 103SP06	220, 54 NW	40, 149	N	CUTS F344?	18°06'15"N; 66°55'17"W
341	ME	Rd 365 103SP06	290, 89 NE	66, 004	?		18°06'15"N; 66°55'17"W
342	ME	Rd 365 103SP06	291, 85 NE	45, 296	LL-N?	GOUGE 1.5 CM	18°06'15"N; 66°55'17"W
343	ME	Rd 365 103SP06	261, 48 NW	47, 165	N		18°06'15"N; 66°55'17"W
344	ME	Rd 365 103SP06	234, 67 NW	67, 316	?	OLD?	18°06'15"N; 66°55'17"W
				18, 046	LL?	YOUNG?	
345	ME	Rd 365 104SP06	193, 35 NW	05, 021	RL		18°06'14"N; 66°55'17"W
				30, 245	?		
346	ME	Rd 365 104SP06	234, 45 NW	08, 205	RL	YOUNG?	18°06'14"N; 66°55'17"W
				38, 293	N	OLD?	
347	ME	Rd 365 104SP06	234, 45 NW		?	CUTS SH254	18°06'14"N; 66°55'17"W
348	ME	Rd 365 104SP06	276, 55 SW	12, 105	N-LL		18°06'14"N; 66°55'17"W
349	ME	Rd 365 104SP06	291, 36 NE	19, 165	RL??	YOUNG??	18°06'14"N; 66°55'17"W
				32, 240	?	OLD??	
350	ME	Rd 365 104SP06	232, 18 NW	18, 318	N	CUTS F349 GOUGE AND BRECCIA	18°06'14"N; 66°55'17"W
351	ME	Rd 365 104SP06	289, 64 NE	00, 289	LL	35 CM THICK	18°06'14"N; 66°55'17"W

352	ME	Rd 365 104SP06	312, 28 SW	27, 240	T		18°06'14"N; 66°55'17"W
353	ME	Rd 365 105SP06	328, 68 SW	45, 172	?		18°06'13"N; 66°55'17"W
354	ME	Rd 365 105SP06	250, 58 SE	17, 242	LL		18°06'13"N; 66°55'17"W
355	ME	Rd 365 105SP06	241, 43 SE	28, 175	N		18°06'13"N; 66°55'17"W
				09, 267	LL??		
356	ME	Rd 365 105SP06	270, 40 S	32, 167	N?		18°06'13"N; 66°55'17"W
357	ME	Rd 365 109SP06	284, 82 SW	26, 274	LL		18°06'08"N; 66°55'31"W
358	ME	Rd 365 109SP06	308, 51 NE		?	2 M THICK	18°06'08"N; 66°55'31"W
359	ME	Rd 365 110SP06	274, 68 NE		?	CUTS SH281	18°06'06"N; 66°55'32"W
360	ME	Rd 365 110SP06	261, 89 NW	12, 270	?		18°06'06"N; 66°55'32"W
361	ME	Rd 365 110SP06	260, 87 NW	10, 255	LL??	CUTS FS185	18°06'06"N; 66°55'32"W
362	ME	Rd 365 110SP06	308, 60 NE	11, 314	LL-N	CUTS SH285	18°06'06"N; 66°55'32"W
363	ME	Rd 365 110SP06	324, 65 NE	59, 036	N?	CUTS SH285	18°06'06"N; 66°55'32"W
364	ME	Rd 365 110SP06	324, 53 SW	52, 240	N		18°06'06"N; 66°55'32"W
365	ME	Rd 365 112SP06	254, 70 NW	58, 289	N??		18°05'56"N; 66°55'39"W
366	ME	Rd 365 112SP06	215, 55 NW	55, 304	N??		18°05'56"N; 66°55'39"W
367	ME	Rd 365 114SP06	253, 41 SE		N???	CUTS FS189 AND FS 190	18°05'48"N; 66°55'38"W
368	ME	Rd 365 114SP06	285, 45 NE	STEEP	?		18°05'48"N; 66°55'38"W
369	ME	Rd 365 116SP06	338, 87 SW	05, 328	RL		18°04'57"N; 66°56'21"W
370	ME	Rd 365 116SP06	306, 76 NE	55, 329	N??		18°04'57"N; 66°56'21"W
				14, 156	?		
371	ME	Rd 365 116SP06	342, 37 SW	12, 319	R	0.5 M THICK	18°04'57"N; 66°56'21"W
372	ME	Rd 365 116SP06	350, 52 SW	49, 268	R	CURVES	18°04'57"N; 66°56'21"W
373	ME	Rd 365 116SP06	230, 74 NW	SHALLOW	?	CUTS F372	18°04'57"N; 66°56'21"W
374	ME	Rd 365 116SP06	345, 79 NE	31, 166	RL		18°04'57"N; 66°56'21"W
375	ME	Rd 365 116SP06	258, 62 NW		?		18°04'57"N; 66°56'21"W
376	ME	Rd 365 117SP06	284, 70 SW	69, 183	?		18°04'54"N; 66°56'22"W
377	ME	Rd 365 117SP06	258, 84 SE	79, 188	?		18°04'54"N; 66°56'22"W
378	ME	Rd 365 117SP06	305, 57 SW	26, 273	R??	CUTS F379 AND F382	18°04'54"N; 66°56'22"W
379	ME	Rd 365 117SP06	344, 65 NE	10, 349	RL		18°04'54"N; 66°56'22"W
380	ME	Rd 365 117SP06	275, 29 NE	26, 044	T		18°04'54"N; 66°56'22"W
381	ME	Rd 365 117SP06	288, 78 SW	78, 203	N	CUTS F380 AND SH297	18°04'54"N; 66°56'22"W

382	ME	Rd 365 117SP06	296, 30 NE	30, 335	T		18°04'54"N; 66°56'22"W
383	ME	Rd 365 118SP06	343, 55 NE		?		18°04'47"N; 66°56'27"W
384	ME	Rd 365 118SP06	273, 55 SW	15, 263	LL?		18°04'47"N; 66°56'27"W
385	ME	Rd 365 119SP06	218, 55 NW	09, 223	LL?		18°04'47"N; 66°56'27"W
386	ME	Rd 365 119SP06	322, 85 SW	07, 143	RL		18°04'47"N; 66°56'27"W
387	ME	Rd 365 119SP06	236, 67 NW	16, 236	LL-N		18°04'47"N; 66°56'27"W
388	ME	Rd 365 119SP06	317, 36 SW	18, 157	RL	YOUNG	18°04'47"N; 66°56'27"W
				26, 250	T	OLD	
389	ME	Rd 364 120SP06	278, 72 NE	20, 278	LL??		18°06'40"N; 66°56'11"W
390	ME	Rd 364 120SP06	262, 20 NW	20, 340	?		18°06'40"N; 66°56'11"W
391	ME	Rd 364 120SP06	295, 51 SW	42, 175	N		18°06'40"N; 66°56'11"W
392	ME	Rd 364 122SP06	211, 32 NW		?		18°06'23"N; 66°56'13"W
393	ME	Rd 364 122SP06	342, 85 SW	48, 168	?		18°06'23"N; 66°56'13"W
394	ME	Rd 364 122SP06	324, 88 NE	00, 324	LL		18°06'23"N; 66°56'13"W
395	ME	Rd 364 122SP06	340, 90	75, 156	WEST DOWN		18°06'23"N; 66°56'13"W
396	ME	Rd 364 122SP06	343, 73 SW	08, 166	LL		18°06'23"N; 66°56'13"W
397	ME	Rd 364 123SP06	185, 30 SE	238, 30 NW	N?? TOP TO SE		18°06'05"N; 66°56'06"W
398	ME	Rd 364 124SP06	175, 52 NE		?		18°06'02"N; 66°56'10"W
399	ME	Rd 364 124SP06	327, 78 NE	78, 176	?		18°06'02"N; 66°56'10"W
400	ME	Rd 364 124SP06	348, 78 NE	04, 349	?	CUTS FS202	18°06'02"N; 66°56'10"W
401	ME	Rd 364 124SP06	275, 90	30, 100	?	ON D5	18°06'02"N; 66°56'10"W
402	ME	Rd 364 124SP06	343, 63 NE		N???	BIG; CUTS D5 AND SERP.	18°06'02"N; 66°56'10"W
403	ME	Rd 364 125SP06	284, 30 NE	13, 356	?		18°05'56"N; 66°56'15"W
404	ME	Rd 364 125SP06	311, 52 NE	04, 128	?		18°05'56"N; 66°56'15"W
405	ME	Rd 364 125SP06	316, 20 NE	05, 197	?	OLD?	18°05'56"N; 66°56'15"W
				04, 126	?	YOUNG?	
406	ME	Rd 364 126SP06	355, 32 SE	31, 125	?	CUTS F 407 AND SH334	18°05'21"N; 66°56'53"W
407	ME	Rd 364 126SP06	345, 84 NE	05, 166	?	CUTS SH334	18°05'21"N; 66°56'53"W
408	ME	Rd 364 126SP06	175, 60 SW		?		18°05'21"N; 66°56'53"W
409	ME	Rd 362 128SP06	305, 74 SW	28, 160	?		18°08'19"N; 66°58'11"W
410	ME	Rd 362 128SP06	308, 37 SW	?			18°08'19"N; 66°58'11"W
411	ME	Rd 362 128SP06	219, 66 SE	22, 202	RL		18°08'19"N; 66°58'11"W

412	ME	Rd 362 128SP06	189, 89 SE	20, 189	RL	CUTS SH345	18°08'19"N; 66°58'11"W
413	ME	Rd 362 129SP06	283, 46 SW		?	CUTS F414 AND SH346	18°08'16"N; 66°58'13"W
414	ME	Rd 362 129SP06	181, 78 NW	20, 180	RL		18°08'16"N; 66°58'13"W
415	ME	Rd 362 129SP06	281, 54 SW		?		18°08'16"N; 66°58'13"W
416	ME	Rd 362 129SP06	204, 65 NW	15, 213	RL		18°08'16"N; 66°58'13"W
417	ME	Rd 362 129SP06	238, 35 SE	33, 124	?	CUTS SH349; OLD??	18°08'16"N; 66°58'13"W
				16, 075	?	YOUNG??	
418	ME	Rd 362 129SP06	322, 88 NE	62, 138	?		18°08'16"N; 66°58'13"W
419	ME	Rd 362 130SP06	224, 80 SE	09, 057	RL		18°08'11"N; 66°58'15"W
420	ME	Rd 362 130SP06	337, 41 NE	32, 078	N		18°08'11"N; 66°58'15"W
421	ME	Rd 362 131SP06	255, 47 SE	20, 233	LL-R		18°08'07"N; 66°58'15"W
422	ME	Rd 362 131SP06	256, 58 SE	45, 105	N		18°08'07"N; 66°58'15"W
423	ME	Rd 362 131SP06	175, 72 SW	72, 255	?	CUTS SH353	18°08'07"N; 66°58'15"W
424	ME	Rd 362 131SP06	234, 57 SE	01, 056	RL?		18°08'07"N; 66°58'15"W
425	ME	Rd 362 131SP06	252, 75 SE	74, 187	N		18°08'07"N; 66°58'15"W
426	ME	Rd 362 134SP06	273, 76 SW	11, 096	LL		18°08'01"N; 66°58'16"W
427	ME	Rd 362 134SP06	265, 81 NW	56, 080	LL??		18°08'01"N; 66°58'16"W
428	ME	Rd 362 134SP06	252, 81 SE	74, 106	N??		18°08'01"N; 66°58'16"W
429	ME	Rd 362 135SP06	184, 37 NE		?	CUTS SH361	18°07'55"N; 66°58'15"W
430	ME	Rd 362 135SP06	190, 63 SE		N	CUTS SH361; OFFSET 8 CM	18°07'55"N; 66°58'15"W
431	ME	Rd 362 137SP06	301, 66 SW		?		18°08'09"N; 66°58'43"W
432	ME	Rd 362 138SP06	204, 66 SE	25, 035	RL		18°08'05"N; 66°58'44"W
433	ME	Rd 362 139SP06	310, 35 SW		R		18°07'58"N; 66°58'46"W
434	ME	Rd 362 140SP06	246, 75 SE		?	CUTS F436	18°07'51"N; 66°58'59"W
435	ME	Rd 362 140SP06	220, 88 SE	19, 219	?		18°07'51"N; 66°58'59"W
436	ME	Rd 362 140SP06	251, 54 SE	54, 161	N?	BIG	18°07'51"N; 66°58'59"W
437	ME	Rd 362 142SP06	346, 72 NE	70, 105	N??	YOUNG???; CUTS SH371 AND SH372	18°07'45"N; 66°59'02"W
				11, 350	LL	OLD???	
438	ME	VEREDA DESCANSO 144SP06	230, 21 NW	16, 331	N??		18°09'11"N; 67°00'34"W
439	ME	VEREDA DESCANSO 145SP06	302, 67 SW		?		18°09'09"N; 67°00'34"W

440	ME	VEREDA DESCANSO 145SP06	314, 66 SW		?	CUTS SH373	18°09'09"N; 67°00'34"W
441	ME	VEREDA DESCANSO 145SP06	328, 74 SW		?	CUTS SH373	18°09'09"N; 67°00'34"W
442	ME	VEREDA DESCANSO 145SP06	334, 84 SW	14, 330	RL?		18°09'09"N; 67°00'34"W
443	ME	VEREDA DESCANSO 145SP06	325, 84 SW	00-05			18°09'09"N; 67°00'34"W
444	ME	VEREDA DESCANSO 145SP06	314, 65 SW		?		18°09'09"N; 67°00'34"W
445	ME	VEREDA DESCANSO 145SP06	304, 80 SW		?		18°09'09"N; 67°00'34"W
446	ME	VEREDA DESCANSO 145SP06	308, 86 SW	00-10	?		18°09'09"N; 67°00'34"W
447	ME	VEREDA DESCANSO 145SP06	285, 71 NE	05, 106	LL?		18°09'09"N; 67°00'34"W
448	ME	VEREDA DESCANSO 146SP06	322, 84 SW		N-RL	DRAG FOLD	18°09'07"N; 67°00'34"W
449	ME	VEREDA DESCANSO 147SP06	186, 88 NW	44, 190	RL		18°09'06"N; 67°00'37"W
450	ME	VEREDA DESCANSO 147SP06	310, 30 SW	24, 150	N		18°09'06"N; 67°00'37"W
451	ME	V. N OF DESCANSO 148SP06	001, 45 NW	24, 335		CUTS FS232	18°09'51"N; 67°01'03"W
452	ME	V. N OF DESCANSO 148SP06	252, 41 NW	12, 252	LL	1 M THICK; BRECCIA	18°09'51"N; 67°01'03"W
453	ME	V. N OF DESCANSO 148SP06	001, 24 NW	17, 192	LL-N		18°09'51"N; 67°01'03"W
454	ME	V. N OF DESCANSO 150SP06	232, 82 SE	45, 222	?		18°09'53"N; 67°01'12"W
455	G	Rd 369 152SP06	240, 48 SE	50, 215	?		18°03'23"N; 66°56'59"W
456	G	Rd 369 152SP06	303, 76 SW	68, 247	?	WITHIN SS	18°03'23"N; 66°56'59"W
457	G	Rd 369 152SP06	218, 88 SE	47, 218	LL-R	WITHIN SS	18°03'23"N; 66°56'59"W
458	G	Rd 369 152SP06	321, 88 SW	60, 313	?	WITHIN SS	18°03'23"N; 66°56'59"W
459	G	Rd 369 152SP06	288, 46 SW	46, 193	?	WITHIN SS	18°03'23"N; 66°56'59"W
460	G	Rd 369 152SP06	302, 77 SW	50, 284	?	WITHIN SS	18°03'23"N; 66°56'59"W
461	ME	VEREDA DESCANSO 153SP06	308, 71 NE	16, 313	RL	CUTS F462	18°08'47"N; 67°01'13"W
462	ME	VEREDA DESCANSO 153SP06	338, 58 SW	20, 326	RL TOP TO NW		18°08'47"N; 67°01'13"W
463	ME	VEREDA DESCANSO 153SP06	326, 45 SW	11, 151	TOP TO NW		18°08'47"N; 67°01'13"W
464	ME	VEREDA DESCANSO 153SP06	297, 55 SW	42, 240	R		18°08'47"N; 67°01'13"W

465	ME	VEREDA DESCANSO 153SP06	274, 35 SW	32, 199	?	OLD	18°08'47"N; 67°01'13"W
				21, 134	?	YOUNG	
466	ME	VEREDA DESCANSO 153SP06	345, 60 NE	06, 344	LL	CUTS F463 AND F465	18°08'47"N; 67°01'13"W
467	ME	VEREDA DESCANSO 153SP06	328, 40 NE	30, 019	N	OLD??	18°08'47"N; 67°01'13"W
				34, 124	?	YOUNG??	
468	ME	VEREDA DESCANSO 153SP06	215, 60 SE	09, 215	RL??	YOUNG?	18°08'47"N; 67°01'13"W
				59, 125	?	OLD?	
				33, 063	?	OLDEST?	
469	ME	VEREDA DESCANSO 153SP06	300, 59 SW	09, 281	LL	CUTS F471	18°08'47"N; 67°01'13"W
470	ME	VEREDA DESCANSO 153SP06	255, 42 SE	18, 219	TOP TO NE		18°08'47"N; 67°01'13"W
471	ME	VEREDA DESCANSO 153SP06	360, 59 W	55, 243	?		18°08'47"N; 67°01'13"W
472	ME	VEREDA DESCANSO 153SP06	295, 72 SW	32, 130	RL	BRECCIA; 2 M THICK	18°08'47"N; 67°01'13"W
473	ME	VEREDA DESCANSO 153SP06	000, 48 E	48, 088	?		18°08'47"N; 67°01'13"W
474	ME	Rd 371 156SP06	309, 35 NE	30, 057	N???		18°05'17"N; 66°53'24"W
475	ME	Rd 371 157SP06	335, 32 SW	21, 193	?		18°04'59"N; 66°53'15"W
476	ME	Rd 371 157SP06	245, 45 NW		?	CUTS F475	18°04'59"N; 66°53'15"W
477	ME	Rd 371 157SP06	282, 42 SW		?		18°04'59"N; 66°53'15"W
478	ME	Rd 371 159SP06	335, 43 NE	12, 000	RL		18°04'55"N; 66°53'18"W
479	ME	Rd 371 159SP06	315, 90	14, 317	LL??		18°04'55"N; 66°53'18"W
480	ME	Rd 371 161SP06	333, 73 SW	00, 333	?		18°04'53"N; 66°53'17"W
481	ME	Rd 371 163SP06	262, 40 NW	40, 330	N	CUTS SH429	18°04'37"N; 66°53'08"W
482	ME	Rd 371 163SP06	209, 32 SE	32, 122	N??		18°04'37"N; 66°53'08"W
483	ME	C. QUIN. OFF Rd 368 164SP06	313, 58 NE		R	CONTACT SERP.-SAB. GRANDE	18°02'49"N; 66°54'07"W
484	ME	OFF Rd 368 165SP06	205, 74 SE		R	CONTACT SERP.-SAB. GRANDE	18°02'57"N; 66°53'47"W
			188, 57 SE				
485	ME	OFF Rd 368 165SP06	346, 24 NE	20, 098	?	CUTS FS254, FS255,AND SH430	18°02'57"N; 66°53'47"W

486	ME	OFF Rd 368 165SP06	337, 75 SW		?		18°02'57"N; 66°53'47"W
487	ME	OFF Rd 368 165SP06	188, 64 SE		?		18°02'57"N; 66°53'47"W
488	ME	OFF Rd. 368 166SP06	268, 45 SE		R	CONTACT SERP.-SAB. GRANDE	18°02'49"N; 66°53'23"W
489	ME	OFF Rd. 361 172SP06	319, 71 SW	04, 140	RL??		18°08'28"N; 67°00'18"W
490	ME	OFF Rd. 361 172SP06	310, 87 SW	00, 310	RL		18°08'28"N; 67°00'18"W
491	ME	Rd. TO SUSUA OFF 368 175SP06	254, 82 NW		?		18°04'29"N; 66°56'00"W
492	ME	Rd. TO SUSUA OFF 368 175SP06	252, 48 NW		?		18°04'29"N; 66°56'00"W
493	ME	Rd. TO SUSUA OFF 368 175SP06	284, 75 SW	24, 277	LL		18°04'29"N; 66°56'00"W
				44, 119	?		
494	ME	Rd. TO SUSUA OFF 368 175SP06	229, 59 NW		?		18°04'29"N; 66°56'00"W
495	ME	Rd. TO SUSUA OFF 368 175SP06	200, 56 NW	40, 011	N		18°04'29"N; 66°56'00"W
496	ME	Rd. TO SUSUA OFF 368 175SP06	192, 60 NW	02, 193	RL??		18°04'29"N; 66°56'00"W
497	ME	Rd. TO SUSUA OFF 368 175SP06	225, 63 NW	36, 024	?		18°04'29"N; 66°56'00"W
498	ME	Rd. TO SUSUA OFF 368 176SP06	245, 84 NW	28, 248	LL		18°04'29"N; 66°55'58"W
499	ME	Rd. TO SUSUA OFF 368 179SP06	276, 40 NE	38, 208	?	YOUNG CUTS SHZS	18°04'28"N; 66°55'45"W
500	ME	Rd. TO SUSUA OFF 368 179SP06	310, 51 NE	48, 210	?		18°04'28"N; 66°55'45"W
501	ME	Rd. TO SUSUA OFF 368 181SP06	316, 84 NE		?		18°04'23"N; 66°55'39"W
502	ME	Rd. TO SUSUA OFF 368 181SP06	342, 26 NE	TOP TO S			18°04'23"N; 66°55'39"W
503	ME	Rd. TO SUSUA OFF 368 182SP06	334, 45 SW	43, 223	N??		18°04'24"N; 66°55'37"W
504	ME	Rd. TO SUSUA OFF 368 183SP06	279, 22 NE	21, 020	?		18°04'22"N; 66°55'34"W
505	ME	Rd. TO SUSUA OFF 368 187SP06	246, 12 NW	03, 260	TOP TO W		18°04'20"N; 66°55'19"W
506	ME	Rd. TO SUSUA OFF 368 188SP06	325, 80 NE	34, 322	LL	YOUNG?	18°04'20"N; 66°55'14"W
507	ME	Rd. TO SUSUA OFF 368 190SP06	274, 89 SW	78, 173	?		18°04'20"N; 66°55'03"W
508	ME	Rd. TO SUSUA OFF 368 190SP06	302, 60 NE	45, 087	N		18°04'20"N; 66°55'03"W

509	ME	Rd. TO SUSUA OFF 368 191SP06	285, 23 SW		?		18°04'13"N; 66°54'53"W
510	ME	Rd. TO SUSUA OFF 368 191SP06	239, 85 SE		?	CUTS F509	18°04'13"N; 66°54'53"W
511	ME	Rd. TO SUSUA OFF 368 191SP06	337, 50 SW		?		18°04'13"N; 66°54'53"W
512	ME	Rd. TO SUSUA OFF 368 195SP06	303, 27 NE		?		18°04'05"N; 66°54'45"W
513	ME	Rd. TO SUSUA OFF 368 196SP06	263, 59 NW	39, 273	N		18°04'02"N; 66°54'44"W
514	ME	Rd. TO SUSUA OFF 368 197SP06	222, 30 NW	30, 312	T		18°04'03"N; 66°54'43"W
515	ME	Rd. TO SUSUA OFF 368 197SP06	240, 44 NW	32, 335	T		18°04'03"N; 66°54'43"W
516	ME	Rd. TO SUSUA OFF 368 197SP06	224, 53 NW	29, 320	R??		18°04'03"N; 66°54'43"W
517	ME	Rd. TO SUSUA OFF 368 197SP06	237, 37 NW	28, 322	?		18°04'03"N; 66°54'43"W
518	ME	Rd. TO SUSUA OFF 368 197SP06	245, 56 NW	23, 048	?		18°04'03"N; 66°54'43"W
519	ME	Rd. TO SUSUA OFF 368 197SP06	291, 34 NE	32, 010	R		18°04'03"N; 66°54'43"W
520	ME	Rd. TO SUSUA OFF 368 197SP06	262, 32 NW		?		18°04'03"N; 66°54'43"W
521	ME	Rd. TO SUSUA OFF 368 197SP06	280, 62 SW	61, 207	N?		18°04'03"N; 66°54'43"W
522	ME	Rd. TO SUSUA OFF 368 198SP06	288, 27 SW		?	CUTS SH559???	18°04'07"N; 66°54'41"W
523	ME	Rd. TO SUSUA OFF 368 198SP06	211, 48 NW	11, 021	LL		18°04'07"N; 66°54'41"W
524	ME	Rd. TO SUSUA OFF 368 198SP06	282, 45 NE	45, 032	?		18°04'07"N; 66°54'41"W
525	ME	Rd. TO SUSUA OFF 368 198SP06	270, 66 S		N	CUTS SH562 AND SH562	18°04'07"N; 66°54'41"W
526	ME	Rd. TO SUSUA OFF 368 198SP06	253, 35 NW		N	CUTS SH562 AND SH563	18°04'07"N; 66°54'41"W
527	ME	Rd. TO SUSUA OFF 368 198SP06	215, 49 NW	32, 011	?		18°04'07"N; 66°54'41"W
528	ME	Rd. TO SUSUA OFF 368 198SP06	258, 32 NW	19, 063	N???		18°04'07"N; 66°54'41"W
529	ME	Rd. TO SUSUA OFF 368 198SP06	272, 48 NE	47, 015	N		18°04'07"N; 66°54'41"W
530	ME	Rd. TO SUSUA OFF 368 198SP06	276, 86 NE	49, 094	LL	CUTS F529	18°04'07"N; 66°54'41"W
531	ME	Rd. TO SUSUA OFF 368 198SP06	194, 81 NW	10, 196	RL		18°04'07"N; 66°54'41"W

532	ME	Rd. TO SUSUA OFF 368 199SP06	266, 70 SE	15, 092	RL		18°04'08"N; 66°54'41"W
533	ME	Rd. TO SUSUA OFF 368 199SP06	351, 17 NE		?		18°04'08"N; 66°54'41"W
534	ME	Rd. TO SUSUA OFF 368 201SP06	244, 41 NW	34, 318	N	CUTS F535	18°04'12"N; 66°54'38"W
535	ME	Rd. TO SUSUA OFF 368 201SP06	230, 78 NW	14, 051	RL		18°04'12"N; 66°54'38"W
536	ME	Rd. TO SUSUA OFF 368 201SP06	243, 31 NW	23, 272	TOP TO NW	YOUNG?	18°04'12"N; 66°54'38"W
				24, 021	T??	OLD?	
537	ME	Rd. TO SUSUA OFF 368 201SP06	220, 37 SE	37, 115	N		18°04'12"N; 66°54'38"W
538	ME	Rd. TO SUSUA OFF 368 201SP06	305, 80 NE		?		18°04'12"N; 66°54'38"W
539	ME	Rd. TO SUSUA OFF 368 201SP06	242, 59 SE	55, 133	?		18°04'12"N; 66°54'38"W
540	ME	Rd. TO SUSUA OFF 368 201SP06	198, 50 SE	48, 110	N??	CUTS F541 AND F542	18°04'12"N; 66°54'38"W
541	ME	Rd. TO SUSUA OFF 368 201SP06	255, 77 SE	40, 078	LL		18°04'12"N; 66°54'38"W
542	ME	Rd. TO SUSUA OFF 368 201SP06	261, 64 NW	16, 085	LL		18°04'12"N; 66°54'38"W
543	ME	Rd. TO SUSUA OFF 368 201SP06	248, 42 SE	26, 092	R		18°04'12"N; 66°54'38"W
544	ME	Rd. TO SUSUA OFF 368 201SP06	220, 51 SE	49, 095	?		18°04'12"N; 66°54'38"W
545	ME	Rd. TO SUSUA OFF 368 201SP06	318, 58 NE	21, 124	RL??	OLD	18°04'12"N; 66°54'38"W
				55, 076	N	YOUNG	
546	ME	Rd. TO SUSUA OFF 368 201SP06	318, 60 NE	60, 075	?		18°04'12"N; 66°54'38"W
547	ME	Rd. TO SUSUA OFF 368 201SP06	233, 78 SE	40, 064	N?		18°04'12"N; 66°54'38"W
548	ME	Rd. TO SUSUA OFF 368 201SP06	338, 50 NE	50, 101	?		18°04'12"N; 66°54'38"W
549	ME	Rd. TO SUSUA OFF 368 203SP06	284, 34 SW	34, 224	?		18°04'16"N; 66°54'38"W
550	ME	Rd. TO SUSUA OFF 368 203SP06	197, 35 NW	20, 221	TOP TO NE		18°04'16"N; 66°54'38"W
551	ME	Rd. TO SUSUA OFF 368 203SP06	271, 70 NE	66, 327	R?		18°04'16"N; 66°54'38"W
552	ME	Rd. TO SUSUA OFF 368 206SP06	270, 82 S	36, 094	LL?		18°04'15"N; 66°54'33"W
553	ME	Rd. TO SUSUA OFF 368	260, 37 SE	26, 138	N	CUTS F554	18°04'20"N; 66°54'31"W

		208SP06					
554	ME	Rd. TO SUSUA OFF 368 208SP06	140, 10 NE	09, 001	T		18°04'20"N; 66°54'31"W
555	ME	Rd. TO SUSUA OFF 368 209SP06	179, 46 SW	03, 358	RL?		18°04'19"N; 66°54'30"W
556	ME	Rd. TO SUSUA OFF 368 209SP06	268, 60 SE	45, 120	N	YOUNG??	18°04'19"N; 66°54'30"W
				14, 091	LL	OLD??	
557	ME	Rd. TO SUSUA OFF 368 209SP06	248, 76 NW	17, 066	LL?		18°04'19"N; 66°54'30"W
558	ME	Rd. TO SUSUA OFF 368 210SP06	320, 50 SW	20, 158	R??		18°04'17"N; 66°54'31"W
559	ME	Rd. TO SUSUA OFF 368 210SP06	318, 50 SW	34, 151	R		18°04'17"N; 66°54'31"W
560	ME	Rd. TO SUSUA OFF 368 210SP06	322, 77 SW	39, 158	R		18°04'17"N; 66°54'31"W
561	ME	Rd. TO SUSUA OFF 368 210SP06	264, 51 SE		?		18°04'17"N; 66°54'31"W
562	ME	Rd. TO SUSUA OFF 368 210SP06	296, 45 NE		?		18°04'17"N; 66°54'31"W
563	ME	Rd. TO SUSUA OFF 368 210SP06	296, 30 NE	28, 356	T	CUTS F564	18°04'17"N; 66°54'31"W
564	ME	Rd. TO SUSUA OFF 368 210SP06	358, 55 SW		?		18°04'17"N; 66°54'31"W
565	ME	Rd. TO SUSUA OFF 368 211SP06	192, 56 NW		?		18°04'06"N; 66°54'21"W
566	ME	Rd. TO SUSUA OFF 368 212SP06	176, 30 SW		?		18°03'57"N; 66°54'13"W
567	ME	Rd. TO SUSUA OFF 368 213SP06	247, 89 NW	54, 247	N		18°03'57"N; 66°54'03"W
568	ME	Rd. TO SUSUA OFF 368 213SP06	255, 27 NW		?		18°03'57"N; 66°54'03"W
569	ME	Rd. TO SUSUA OFF 368 213SP06	257, 82 SE	21, 077	LL THEN R?	STRIATION BENDS 28, 267	18°03'57"N; 66°54'03"W
570	ME	Rd. TO SUSUA OFF 368 213SP06	286, 32 NE	22, 012	R	CUTS F271	18°03'57"N; 66°54'03"W
571	ME	Rd. TO SUSUA OFF 368 213SP06	290, 44 SW	44, 200	R??		18°03'57"N; 66°54'03"W
572	ME	Rd. TO SUSUA OFF 368 213SP06	281, 83 NE	47, 280	LL		18°03'57"N; 66°54'03"W
573	ME	Rd. TO SUSUA OFF 368 214SP06	285, 63 NE		?		18°03'55"N; 66°53'55"W
574	ME	Rd. TO SUSUA OFF 368 215SP06	193, 42 NW	31, 331	R??		18°03'58"N; 66°53'49"W
575	ME	Rd. TO SUSUA OFF 368	280, 60 NE	05, 285	LL		18°03'48"N; 66°53'49"W

		216SP06					
576	ME	Rd. TO SUSUA OFF 368 216SP06	313, 67 NE		?		18°03'48"N; 66°53'49"W
577	ME	Rd. TO SUSUA OFF 368 216SP06	316, 58 NE	09, 322	?		18°03'48"N; 66°53'49"W
578	ME	Rd. TO SUSUA OFF 368 216SP06	305, 89 SW	49, 304	LL		18°03'48"N; 66°53'49"W
579	ME	Rd. TO SUSUA OFF 368 217SP06	252, 83 SE	30, 072	LL		18°03'36"N; 66°53'39"W
580	ME	Rd. TO SUSUA OFF 368 217SP06	347, 11 SW	10, 237	N	YOUNG	18°03'36"N; 66°53'39"W
				04, 300	?	OLD	
581	ME	Rd. TO SUSUA OFF 368 217SP06	336, 46 SW	13, 318	RL	YOUNG??	18°03'36"N; 66°53'39"W
				44, 232	N	OLD??	
582	ME	Rd. TO SUSUA OFF 368 217SP06	235, 89 SE	07, 235	LL		18°03'36"N; 66°53'39"W
583	ME	TRAIL N OF SUSUA 223SP06	274, 85 NE	22, 276	LL		18°04'19"N; 66°54'22"W
584	ME	TRAIL N OF SUSUA 223SP06	175, 73 NE	09, 172	RL		18°04'19"N; 66°54'22"W
585	ME	TRAIL N OF SUSUA 223SP06	198, 88 SE	27, 197	RL		18°04'19"N; 66°54'22"W
				38, 196	?		
586	ME	TRAIL N OF SUSUA 223SP06	253, 89 NW	10, 253	LL		18°04'19"N; 66°54'22"W
587	ME	TRAIL N OF SUSUA 223SP06	272, 55 SW	35, 242	?		18°04'19"N; 66°54'22"W
588	ME	TRAIL N OF SUSUA 223SP06	269, 79 SE	13, 085	?		18°04'19"N; 66°54'22"W
589	ME	TRAIL N OF SUSUA 223SP06	296, 72 SW	27, 125	LL		18°04'19"N; 66°54'22"W
				56, 263	?		
590	ME	TRAIL N OF SUSUA 224SP06	292, 63 SW		N		18°04'26"N; 66°54'20"W
591	ME	TRAIL N OF SUSUA 224SP06	279, 50 NE	08, 254	LL		18°04'26"N; 66°54'20"W
592	ME	TRAIL S OF SUSUA 232SP06	248, 47 NW		N		18°03'25"N; 66°54'20"W
593	ME	TRAIL S OF SUSUA 236SP06	270, 78 N	36, 265	LL		18°03'42"N; 66°54'27"W
594	ME	RANCHERA TRAIL 242SP06	310, 64 NE	64, 042	?		18°05'15"N; 66°54'01"W
595	ME	RANCHERA TRAIL 242SP06	322, 67 SW		?		18°05'15"N; 66°54'01"W

596	ME	RANCHERA TRAIL 242SP06	190, 15 NW	11, 243	T		18°05'15"N; 66°54'01"W
597	ME	RANCHERA TRAIL 242SP06	228, 49 SE	11, 222	LL		18°05'15"N; 66°54'01"W
598	ME	Rd. W OFF Rd. 3345 249SP06	310, 82 SW		R		18°10'32"N; 67°04'55"W
599	ME	Rd. N OFF Rd. 348 252SP06	302, 67 NE		?		18°09'31"N; 67°03'02"W
600	ME	Rd. N OFF Rd. 348 252SP06	326, 88 SW	32, 150	RL??		18°09'31"N; 67°03'02"W
601	ME	Rd. N OFF Rd. 348 253SP06	210, 34 NW	24, 252	N	YOUNGER THAN FS332	18°09'27"N; 67°03'05"W
602	ME	Rd. N OFF Rd. 348 253SP06	223, 60 SE		N	DRAG FOL; CUTS SH789	18°09'27"N; 67°03'05"W
603	ME	Rd. TO SW OF Rd.105 257SP06	248, 65 SE	15, 245	?		18°11'26"N; 67°06'26"W
604	ME	HOUSING OFF Rd.368 282SP06	340, 80 NE	65, 138	?		18°04'10"N; 66°55'54"W
605	ME	PLANT. OFF Rd.366 284SP06	275, 70 SW	53, 246	N		18°08'51"N; 66°57'02"W
606	G	PRIV. PROP. 285SP06	150, 60 SW	55, 188	R-RL		18°03'19"N; 66°58'55"W
607	G	Q Rd.328 AND Rd.321 289SP06	200, 50 NW	34, 237	N-LL	QUARTZITE	18°03'57"N; 66°57'12"W
608	G	Q Rd.328 AND Rd.321 289SP06	238, 90		?	MAFIC VOLCANIC	18°03'57"N; 66°57'12"W
609	G	Q Rd.328 AND Rd.321 289SP06	260, 56 SE			SILTSTONE	18°03'57"N; 66°57'12"W
610	G	Q Rd.328 AND Rd.321 289SP06	237, 35 NW		?	CONTACT MUDSTONE AND SERP	18°03'57"N; 66°57'12"W
611	G	Rd. OFF Rd.318 290SP06	334, 82 NE		R		18°04'48"N; 67°03'44"W
612	G	Rd. 314 292SP06	297, 85 SW	14, 133	LL?	SMALL	18°04'50"N; 67°04'17"W
613	G	Rd. 314 292SP06	294, 84 SW	27, 120	LL???	SMALL	18°04'50"N; 67°04'17"W
614	G	Rd. 314 292SP06	275, 68 SW	66, 192	?	BIG	18°04'50"N; 67°04'17"W
615	G	Rd. 314 292SP06	323, 33 SW		?	BIG	18°04'50"N; 67°04'17"W
616	G	Rd. 314 292SP06	187, 38 NW		N TOP TO SW	CUTS D11	18°04'50"N; 67°04'17"W
617	G	T NW OFF Rd. 3362 293SP06	260, 66 NW		N?		18°05'03"N; 67°00'46"W
618	ME	Rd. to S FROM Rd.349 296SP06	285, 59 NE	44, 324	LL-N		18°10'54"N; 67°06'36"W
619	ME	Rio Bonelli 298SP06	268, 25 SE	25, 181	N		18°09'58"N; 66°58'05"W

Faults in Serpentinite SUMMER 2005

#	B.	Location	Orientation	Striations	Sense	Comments	GPS

1	G	BEACH 05S05	146 39 NE	?		18°09'59"N; 67°11'01"W
2	G	BEACH 05S05	282 48 NE	?		18°09'59"N; 67°11'01"W
3	G	BEACH 05S05	192 42 SE	TOP TO NW??		18°09'59"N; 67°11'01"W
4	G	BEACH 05S05	198 48 SE	?		18°09'59"N; 67°11'01"W
5	G	BEACH 05S05	156 67 NE	?	CUTS F4	18°09'59"N; 67°11'01"W
6	G	BEACH 05S05	150 88 NE	?		18°09'59"N; 67°11'01"W
7	G	BEACH 05S05	204 54 SE	?		18°09'59"N; 67°11'01"W
8	G	BEACH 05S05	270 49 S	?		18°09'59"N; 67°11'01"W
9	G	BEACH 05S05	217 55 SE	?		18°09'59"N; 67°11'01"W
10	G	BEACH 05S05	315 74 NE	RL??		18°09'59"N; 67°11'01"W
11	G	BEACH 05S05	325 80 NE	?		18°09'59"N; 67°11'01"W
12	G	BEACH 06S05	290 73 SW	?		18°09'58"N; 67°11'03"W
13	G	BEACH 06S05	284 85 SW	?		18°09'58"N; 67°11'03"W
14	G	BEACH 06S05	195 47 SE	RL	CUTS D1	18°09'58"N; 67°11'03"W
15	G	BEACH 07S05	152 59 NE	?		18°09'55"N; 67°11'06"W
16	G	BEACH 07S05	333 37 NE	?		18°09'55"N; 67°11'06"W
17	G	BEACH 07S05	304 68 NE	RL??		18°09'55"N; 67°11'06"W
18	G	BEACH 07S05	318 73 SW	?		18°09'55"N; 67°11'06"W
19	G	BEACH 07S05	276 75 SW	?		18°09'55"N; 67°11'06"W
20	G	BEACH 07S05	325 78 NE	RL??		18°09'55"N; 67°11'06"W
21	G	BEACH 07S05	306 77 NE	?		18°09'55"N; 67°11'06"W
22	G	BEACH 07S05	266 81 SE	LL??		18°09'54"N; 67°11'07"W
23	G	BEACH 07S05	301 84 NE	LL??		18°09'54"N; 67°11'07"W
24	G	BEACH 07S05	322 63 SW	?		18°09'54"N; 67°11'07"W
25	G	BEACH 08S05	332 68 SW	?		18°09'53"N; 67°11'08"W
26	G	BEACH 08S05	343 81 SW	?		18°09'53"N; 67°11'08"W
27	G	BEACH 08S05	286 90	?		18°09'53"N; 67°11'08"W
28	G	BEACH 08S05	216 70 NW	?		18°09'53"N; 67°11'08"W
29	G	BEACH 08S05	281 52 SW	?		18°09'53"N; 67°11'08"W
30	G	BEACH 08S05	276 68 SW	?		18°09'53"N; 67°11'08"W
31	G	BEACH 08S05	282 28 SW	?		18°09'53"N; 67°11'08"W
32	G	BEACH 08S05	305 54 SW	?		18°09'53"N; 67°11'08"W
33	G	BEACH 08S05	252 82 SE	LL??		18°09'53"N; 67°11'08"W
34	G	BEACH 08S05	302 45 SW	?		18°09'53"N; 67°11'08"W

35	G	BEACH 08S05	263 70 SE		LL?		18°09'53"N; 67°11'08"W
36	G	BEACH 08S05	315 52 SW		?		18°09'53"N; 67°11'08"W
37	G	BEACH 08S05	248 89 SE		LL?		18°09'53"N; 67°11'08"W
38	G	BEACH 08S05	218 85 SE		RL??		18°09'53"N; 67°11'08"W
39	G	BEACH 08S05	318 65 SW		LL??		18°09'53"N; 67°11'08"W
40	G	BEACH 17S05	314 43 SW		?		18°09'50"N; 67°11'08"W
41	G	OFF Rd.311 18S05	275 67 NE		R??		18°07'35"N; 67°09'13"W
42	G	OFF Rd.311 18S05	241 47 SE		?		18°07'35"N; 67°09'13"W
43	G	OFF Rd.311 18S05	308 66 SW		R		18°07'35"N; 67°09'13"W
44	G	OFF Rd.311 18S05	259 47 NW	48 348	?		18°07'35"N; 67°09'13"W
45	G	Rd. 100 19S05	260 66 NW	50 042	?		18°07'47"N; 67°09'36"W
46	G	Rd. 100 19S05	316 62 NE		?		18°07'47"N; 67°09'36"W
47	G	Rd. 100 19S05	314 85 NE	10 140	?		18°07'47"N; 67°09'36"W
48	G	Rd. 100 19S05	276 80 NE		?		18°07'47"N; 67°09'36"W
49	G	Rd. 100 19S05	214 57 SE		?		18°07'47"N; 67°09'36"W
50	G	Rd. 100 19S05	230 48 SE		?		18°07'47"N; 67°09'36"W
51	G	Rd. 100 19S05	262 59 SE		?		18°07'47"N; 67°09'36"W
52	G	Rd. 100 19S05	282 50 NE		?		18°07'47"N; 67°09'36"W
53	G	Rd. 100 19S05	292 78 NE		?		18°07'47"N; 67°09'36"W
54	G	Rd. 100 19S05	298 65 NE		?		18°07'47"N; 67°09'36"W
55	G	Rd. 100 19S05	272 55 NE	31 311	N??		18°07'47"N; 67°09'36"W
56	G	Rd. 100 19S05	309 75 SW	58 278	N??		18°07'47"N; 67°09'36"W
57	G	Rd. 100 19S05	280 51 NE	50 296	N??		18°07'47"N; 67°09'36"W
58	G	Rd. 100 19S05	274 50 SW	01 150	RL??		18°07'47"N; 67°09'36"W
59	G	Rd. 100 19S05	262 58 NW	54 326	N??		18°07'47"N; 67°09'36"W
60	G	Rd. 100 19S05	296 40 NE	37 075	R	WITHIN DIKE	18°07'47"N; 67°09'36"W
61	G	QUARRY Rd.2 20S05	232 63 NW		?		18°05'23"N; 67°01'23"W
62	G	QUARRY Rd.2 20S05	183 39 SE		?		18°05'23"N; 67°01'23"W
63	G	QUARRY Rd.2 20S05	244 87 SE		?		18°05'23"N; 67°01'23"W
64	G	QUARRY Rd.2 20S05	279 87 SW	16 280	LL		18°05'23"N; 67°01'23"W
65	G	QUARRY Rd.2 20S05	234 43 NW		?		18°05'23"N; 67°01'23"W
66	G	QUARRY Rd.2 20S05	269 79 SE	15 262	LL		18°05'23"N; 67°01'23"W
67	G	QUARRY Rd.2 20S05	270 81 N	50 235	LL-N		18°05'23"N; 67°01'23"W
68	G	QUARRY Rd.2 20S05	190 60 SE	60 099	N??		18°05'23"N; 67°01'23"W

69	G	QUARRY Rd.2 20S05	205 30 SE		?		18°05'23"N; 67°01'23"W
70	G	QUARRY Rd.2 20S05	219 48 NW		?		18°05'23"N; 67°01'23"W
71	G	Rd.2 21S05	265 90		?		18°05'39"N; 67°02'15"W
72	G	BEACH 22S05	268 90		?		18°09'48"N; 67°11'07"W
73	G	BEACH 22S05	270 84 N		LL??		18°09'48"N; 67°11'07"W
74	G	BEACH 22S05	262 72 SE		?		18°09'48"N; 67°11'07"W
75	G	BEACH 22S05	188 85 NW		?		18°09'48"N; 67°11'07"W
76	G	BEACH 22S05	273 76 SW		?		18°09'48"N; 67°11'07"W
77	G	BEACH 22S05	208 57 SE		?		18°09'48"N; 67°11'07"W
78	G	BEACH 22S05	174 76 NE		?		18°09'48"N; 67°11'07"W
79	G	BEACH 23S05	213 30 NW	30 273	R?		18°09'45"N; 67°11'05"W
80	G	BEACH 23S05	310 78 NE				18°09'45"N; 67°11'05"W
81	G	BEACH 24S05	307 38 NE		R?		18°09'45"N; 67°11'05"W
82	G	Rd. 2 25S05	237 66 NW		N	CUTS DIKE	18°05'58"N; 67°02'42"W
83	G	Rd. 2 25S05	262 60 NW	11 258	LL		18°05'58"N; 67°02'42"W
				06 106			18°05'58"N; 67°02'42"W
84	G	Rd. 2 25S05	197 70 NW	05 005	RL-N	CUTS D3	18°05'58"N; 67°02'42"W
85	G	Rd. 2 25S05	236 33 NW		R	CUTS D5	18°05'58"N; 67°02'42"W
86	G	Rd. 2 25S05	243 83 NW		N	CUTS D5/ 1.5 M OFFSET	18°05'58"N; 67°02'42"W
87	G	BEACH 26S05	234 35 NW				18°09'36"N; 67°10'59"W
88	G	BEACH 26S05	330 80 NE		RL	CUTS SH62	18°09'36"N; 67°10'59"W
89	G	BEACH 26S05	256 75 NW		LL		18°09'36"N; 67°10'59"W
90	G	BEACH 26S05	301 73 NE		RL?		18°09'36"N; 67°10'59"W

Faults in Serpentinite SB 2005

#	B.	Location	Orientation	Striations	Sense	Comments	GPS
1	G	Rd #2 Construction	054, 75 NW	25, 074		contact with Yauco	18°6'5"N; 67°2'43"W
2	G	Rd #2 Construction	220, 56 NW		N	near "intrusion" close to int w Rd119	18°6'5"N; 67°2'43"W
3	G	Rd314 S off Rd 102	277, 57 SW	46, 216	T		
4	G	Schoolbus Quarry	296, 76 NE			3cm gouge	
5	G	Schoolbus Quarry	085, 90			10cm thick,	

						3cm gouge	
6	ME	Rd N of Rd368 to Susua	290, 45 NE	45, 037	N	3m thick	18°4'26"N; 66°55'44"W
7	ME	Rd N of Rd368 to Susua	253, 53 SE	34, 124	N		18°4'12"N; 66°54'38"W
8	ME	Rd N of Rd368 to Susua	052, 57 SE	57, 116	N		18°4'12"N; 66°54'38"W
9	ME	Rd N of Rd368 to Susua	244, 52 SE	32, 094	LL? Oblique		18°4'12"N; 66°54'38"W
10	ME	Rd N of Rd368 to Susua	240, 82 NW	44, 037	LL? Oblique		18°4'12"N; 66°54'38"W
11	ME	Rd N of Rd368 to Susua	311, 51 NE	15, 120; 54, 017	LL		18°4'12"N; 66°54'38"W
12	ME	Rd N of Rd368 to Susua	301, 55 NE	24, 145	LL		18°4'12"N; 66°54'38"W
13	ME	Rd N of Rd368 to Susua	272, 65 SW	14, 101			18°4'12"N; 66°54'38"W
14	ME	Rd N of Rd368 to Susua	080, 55 SE	19, 095			18°4'8"N; 66°54'42"W
15	ME	Rd N of Rd368 to Susua	030, 53 SE		T	cuts FS #12	18°4'19"N; 66°55'14"W
16	ME	Rd365 N of SG town	325, 86 SW	05, 145	RL		
17	ME	Yauco Quarry Rd368	262, 47 NW			fracture	
18	ME	Yauco Quarry Rd368	274, 35 NW			fracture	
19	ME	Yauco Quarry Rd368	237, 50 NW	55 SW		rake	
20	ME	Yauco Quarry Rd368	260, 52 NW			fracture	
21	ME	Yauco Quarry Rd368	097, 86 SW			fracture	
22	ME	Yauco Quarry Rd368	289, 54 NE			fracture	
23	ME	Yauco Quarry Rd368	052, 62 NW			fracture	
24	ME	Yauco Quarry Rd368	227, 61 NW	20, 241			
25	ME	Yauco Quarry Rd368	045, 77 NW			fracture	
26	ME	Yauco Quarry Rd368	081, 25 NW	21, 041			
27	ME	Yauco Quarry Rd368	000, 00			fracture	
28	ME	Yauco Quarry Rd368	281, 49 NE			fracture	
29	ME	Yauco Quarry Rd368	311, 50 NE			fracture	
30	ME	Yauco Quarry Rd368	064, 27 SE			fracture	

A.3 FOLIATION IN SERPENTINITE

Foliations in Serpentinite (FS) 2006				
#	B.	Location	Orientation	GPS
1	ME	Rd 362 06SP06	328, 58 SW	18°7'26"N; 66°59'15"W
2	ME	Rd 362 06SP06	141, 40 SW	18°7'26"N; 66°59'15"W
3	ME	Rd 362 06SP06	266, 30 SE	18°7'28"N; 66°59'14"W
4	ME	Rd 362 08SP06	279, 45 NE	18°7'41"N; 66°59'13"W
5	ME	Rd 362 10SP0	303, 62 NE	18°7'45"N; 66°59'6"W
6	ME	Rd 120 15SP06	146, 26 NE	18°8'38"N; 66°58'4"W
7	ME	Rd 119 16SP06	286, 14 NE	18°9'21"N; 67°2'7"W
8	ME	Rd 119 16SP06	277, 30 NE	18°9'21"N; 67°2'7"W
9	ME	Rd 119 16SP06	322, 68 NE	18°9'21"N; 67°2'7"W
10	ME	Rd 119 18SP06	254, 36 NW	18°9'42"N; 67°1'56"W
11	ME	Rd 119 18SP06	289, 70 NE	18°9'42"N; 67°1'56"W
12	ME	Rd 119 18SP06	261, 53 NW	18°9'42"N; 67°1'56"W
13	ME	Rd 119 18SP06	212, 80 NW	18°9'42"N; 67°1'56"W
14	ME	Rd 119 18SP06	242, 81 NW	18°9'42"N; 67°1'56"W
15	ME	Rd 119 18SP06	204, 62 NW	18°9'42"N; 67°1'56"W
16	ME	Rd 119 18SP06	308, 80 SW	18°9'42"N; 67°1'56"W
17	ME	Rd 119 19SP06	234, 69 SE	18°9'38"N; 67°1'53"W
18	ME	Rd 119 22SP06	300, 68 NE	18°9'10"N; 67°2'23"W
19	ME	Rd 120 23SP06	254, 83 NW	18°6'3"N; 66°57'33"W
20	ME	Rd 120 34SP06	286, 61 SW	18°6'57"N; 66°57'03"W
21	ME	Rd 120 34SP06	321, 60 SW	18°6'57"N; 66°57'03"W
22	ME	Rd 120 35SP06	296, 78 SW	18°6'58"N; 66°57'00"W
23	ME	Rd 120 35SP06	311, 81 SW	18°6'58"N; 66°57'00"W
24	ME	Rd 120 38SP06	185, 85 NW	18°7'55"N; 66°57'28"W
25	ME	Rd 120 38SP06	327, 34 SW	18°7'55"N; 66°57'28"W
26	ME	Rd 120 39SP06	334, 73 NE	18°7'49"N; 66°57'27"W
27	ME	Rd 120 39SP06	330, 83 NE	18°7'49"N; 66°57'27"W
28	ME	Rd 120 39SP06	335, 63 SW	18°7'49"N; 66°57'27"W
29	ME	Rd 120 39SP06	194, 50 NW	18°7'49"N; 66°57'27"W
30	ME	Rd 120 39SP06	344, 84 NE	18°7'49"N; 66°57'27"W
31	ME	Rd 120 39SP06	345, 84 NE	18°7'49"N; 66°57'27"W
32	ME	Rd 120 39SP06	182, 80 SE	18°7'49"N; 66°57'27"W
33	ME	Rd 120 39SP06	348, 88 NE	18°7'49"N; 66°57'27"W

34	ME	Rd 120 39SP06	300, 77 NE	18°7'49"N; 66°57'27"W
35	ME	Rd 120 39SP06	199, 71 NW	18°7'49"N; 66°57'27"W
36	ME	Rd 120 39SP06	188, 73 SE	18°7'49"N; 66°57'27"W
37	ME	Rd 120 39SP06	198, 83 SE	18°7'49"N; 66°57'27"W
38	ME	Rd 120 40SP06	235, 54 NW	18°7'43"N; 66°57'22"W
39	ME	Rd 120 40SP06	220, 48 NW	18°7'43"N; 66°57'22"W
40	ME	Rd 120 40SP06	231, 78 NW	18°7'43"N; 66°57'22"W
41	ME	Rd 120 42SP06	189, 86 SE	18°7'37"N; 66°57'11"W
42	ME	Rd 120 42SP06	185, 85 SE	18°7'37"N; 66°57'11"W
43	ME	Rd 120 42SP06	215, 58 SE	18°7'37"N; 66°57'11"W
44	ME	Rd 120 45SP06	274, 90	18°7'13"N; 66°57'0"W
45	ME	Rd 120 47SP06	267, 55 NW	18°7'28"N; 66°57'03"W
46	ME	Rd 120 49SP06	293, 52 NE	18°7'31"N; 66°57'13"W
47	ME	Rd 120 49SP06	296, 36 NE	18°7'31"N; 66°57'13"W
48	ME	Rd 120 50SP06	301, 20 NE	18°8'21"N; 66°57'30"W
49	ME	Rd 120 51SP06	311, 52 NE	18°8'37"N; 66°57'51"W
50	ME	Rd 120 52SP06	312, 50 NE	18°8'35"N; 66°57'53"W
51	ME	Rd 120 53SP06	316, 67 SW	18°8'37"N; 66°58'5"W
52	ME	Rd 120 53SP06	324, 89 NE	18°8'37"N; 66°58'5"W
53	ME	Rd 120 53SP06	310, 80 NE	18°8'37"N; 66°58'5"W
54	ME	Rd 120 53SP06	285, 57 NE	18°8'37"N; 66°58'5"W
55	ME	Rd 120 53SP06	294, 38 NE	18°8'37"N; 66°58'5"W
56	ME	Rd 120 53SP06	308, 45 NE	18°8'37"N; 66°58'5"W
57	ME	Rd 120 53SP06	328, 79 NE	18°8'37"N; 66°58'5"W
58	ME	Rd 120 53SP06	301, 55 NE	18°8'37"N; 66°58'5"W
59	ME	Rd 120 54SP06	198, 85 SE	18°8'36"N; 66°58'7"W
60	ME	Rd 120 55SP06	000, 63 E	18°8'34"N; 66°58'9"W
61	ME	Rd 120 56SP06	300, 48 NE	18°8'30"N; 66°58'12"W
62	ME	Rd 120 56SP06	299, 47 NE	18°8'30"N; 66°58'12"W
63	ME	Rd 120 56SP06	315, 57 NE	18°8'30"N; 66°58'12"W
64	ME	Rd 120 56SP06	334, 58 NE	18°8'30"N; 66°58'12"W
65	ME	Rd 120 57SP06	326, 56 NE	18°8'28"N; 66°58'14"W
66	ME	Rd 120 57SP06	310, 60 NE	18°8'28"N; 66°58'14"W
67	ME	Rd 120 60SP06	200, 30 NW	18°8'58"N; 66°58'55"W
68	ME	Rd 120 61SP06	193, 50 NW	18°8'52"N; 66°59'7"W
69	ME	Rd 120 61SP06	206, 60 NW	18°8'52"N; 66°59'7"W
70	ME	Rd 120 63SP06	333, 55 NE	18°8'56"N; 66°59'14"W
71	ME	Rd 120 63SP06	216, 45 NW	18°8'56"N; 66°59'14"W
72	ME	Rd 120 63SP06	340, 30 SW	18°8'56"N; 66°59'14"W
73	ME	Rd 120 64SP06	301, 15 NE	18°8'53"N; 66°59'23"W
74	ME	Rd 120 66SP06	314, 84 SW	18°9'12"N; 66°59'40"W
75	ME	Rd 120 66SP06	289, 66 NE	18°9'12"N; 66°59'40"W
76	ME	Rd 120 66SP06	354, 15 NE	18°9'12"N; 66°59'40"W
77	ME	Rd 120 66SP06	278, 38 NE	18°9'12"N; 66°59'40"W
78	ME	Rd 120 66SP06	273, 45 NE	18°9'12"N; 66°59'40"W
79	ME	Rd 120 68SP06	204, 60 NW	18°9'18"N; 66°59'45"W
80	ME	Rd 120 68SP06	250, 56 NW	18°9'18"N; 66°59'45"W

81	ME	Rd 120 69SP06	349, 70 NE	18°9'20"N; 66°59'53"W
82	ME	Rd 120 69SP06	352, 75 NE	18°9'20"N; 66°59'53"W
83	ME	Rd 120 70SP06	316, 76 NE	18°9'22"N; 66°59'53"W
84	ME	Rd 120 70SP06	309, 83 SW	18°9'22"N; 66°59'53"W
85	ME	Rd 120 70SP06	288, 26 SW	18°9'22"N; 66°59'53"W
86	ME	Rd 120 70SP06	236, 33 NW	18°9'22"N; 66°59'53"W
87	ME	Rd 120 72SP06	282, 41 SW	18°9'27"N; 66°59'56"W
88	ME	Rd 120 72SP06	230, 40 NW	18°9'27"N; 66°59'56"W
89	ME	Rd 120 72SP06	237, 60 NW	18°9'27"N; 66°59'56"W
90	ME	Rd 120 73SP06	301, 76 SW	18°9'29"N; 66°59'57"W
91	ME	Rd 120 73SP06	295, 87 NE	18°9'29"N; 66°59'57"W
92	ME	Rd 120 73SP06	271, 72 SW	18°9'29"N; 66°59'57"W
93	ME	Rd 120 73SP06	301, 90	18°9'29"N; 66°59'57"W
94	ME	Rd 120 73SP06	282, 81 NE	18°9'29"N; 66°59'57"W
95	ME	Rd 120 73SP06	261, 71 SE	18°9'29"N; 66°59'57"W
96	ME	Rd 120 73SP06	268, 62 SE	18°9'29"N; 66°59'57"W
97	ME	Rd 120 73SP06	276, 70 SW	18°9'29"N; 66°59'57"W
98	ME	Rd 120 73SP06	260, 82 SE	18°9'29"N; 66°59'57"W
99	ME	Rd 120 73SP06	311, 90	18°9'29"N; 66°59'57"W
100	ME	Rd 120 73SP06	273, 87 NE	18°9'29"N; 66°59'57"W
101	ME	Rd 120 73SP06	266, 82 SE	18°9'29"N; 66°59'57"W
102	ME	Rd 120 74SP06	305, 34 NE	18°9'34"N; 66°59'58"W
103	ME	Rd 120 74SP06	300, 65 NE	18°9'34"N; 66°59'58"W
104	ME	Rd 120 74SP06	346, 42 SW	18°9'34"N; 66°59'58"W
105	ME	Rd 120 74SP06	118, 60 NE	18°9'34"N; 66°59'58"W
106	ME	Rd 120 75SP06	265, 76 SE	18°9'37"N; 66°59'57"W
107	ME	Rd 120 77SP06	200, 66 NW	18°9'42"N; 66°59'47"W
108	ME	Rd 120 77SP06	319, 62 SW	18°9'42"N; 66°59'47"W
109	ME	Rd 120 77SP06	215, 36 SE	18°9'42"N; 66°59'47"W
110	ME	Rd 120 78SP06	175, 62 NE	18°9'43"N; 66°59'43"W
111	ME	Rd 120 79SP06	256, 20 SE	18°9'47"N; 66°59'41"W
112	ME	Rd 120 79SP06	293, 10 NE	18°9'47"N; 66°59'41"W
113	ME	Rd 120 79SP06	214, 45 NW	18°9'47"N; 66°59'41"W
114	ME	Rd 120 79SP06	303, 28 SW	18°9'47"N; 66°59'41"W
115	ME	Rd 120 80SP06	296, 05 NE	18°9'55"N; 66°59'42"W
116	ME	Rd 120 80SP06	277, 80 NE	18°9'55"N; 66°59'42"W
117	ME	Rd 120 80SP06	252, 88 SE	18°9'55"N; 66°59'42"W
118	ME	Rd 120 81SP06	275, 85 NE	18°9'55"N; 66°59'42"W
119	ME	Rd 120 82SP06	319, 62 NE	18°10'3"N; 66°59'35"W
120	ME	Rd 120 82SP06	299, 67 NE	18°10'3"N; 66°59'35"W
121	ME	Rd 120 82SP06	294, 63 NE	18°10'3"N; 66°59'35"W
122	ME	Rd 120 82SP06	262, 37 SE	18°10'3"N; 66°59'35"W
123	ME	Rd 362 83SP06	310, 75 NE	18°08'44"N; 66°58'10"W
124	ME	Rd 362 83SP06	315, 45 NE	18°08'44"N; 66°58'10"W
125	ME	Rd 362 83SP06	313, 56 NE	18°08'44"N; 66°58'10"W
126	ME	Rd 362 84SP06	291, 76 NE	18°08'31"N; 66°58'17"W
127	ME	Rd 362 84SP06	302, 87 NE	18°08'31"N; 66°58'17"W

128	ME	Rd 362 85SP06	310, 56 NE	18°08'31"N; 66°58'07"W
129	ME	Rd 362 86SP06	297, 44 NE	18°08'26"N; 66°58'08"W
130	ME	Rd 362 86SP06	292, 84 SW	18°08'26"N; 66°58'08"W
131	ME	Rd 362 86SP06	326, 43 SW	18°08'26"N; 66°58'08"W
132	ME	Rd 362 86SP06	272, 63 NE	18°08'26"N; 66°58'08"W
133	ME	Rd 362 86SP06	248, 28 NW	18°08'26"N; 66°58'08"W
134	ME	Rd 366 87SP06	282, 48 SW	18°08'32"N; 66°57'34"W
135	ME	Rd 366 87SP06	312, 79 SW	18°08'32"N; 66°57'34"W
136	ME	Rd 366 87SP06	298, 37 NE	18°08'32"N; 66°57'34"W
137	ME	Rd 366 88SP06	338, 17 SW	18°08'35"N; 66°57'30"W
138	ME	Rd 366 88SP06	320, 54 SW	18°08'35"N; 66°57'30"W
139	ME	Rd 366 89SP06	292, 75 NE	18°08'36"N; 66°57'27"W
140	ME	Rd 366 90SP06	272, 15 NE	18°08'39"N; 66°57'26"W
141	ME	Rd 366 91SP06	321, 40 NE	18°08'42"N; 66°57'12"W
142	ME	Rd 366 91SP06	344, 43 NE	18°08'42"N; 66°57'12"W
143	ME	Rd 366 91SP06	314, 82 SW	18°08'42"N; 66°57'12"W
144	ME	Rd 366 91SP06	318, 60 NE	18°08'42"N; 66°57'12"W
145	ME	Rd 366 91SP06	251, 12 NW	18°08'42"N; 66°57'12"W
146	ME	Rd 366 91SP06	324, 53 NE	18°08'42"N; 66°57'12"W
147	ME	Rd 366 91SP06	338, 57 NE	18°08'42"N; 66°57'12"W
148	ME	Rd 366 93SP06	325, 73 NE	18°08'44"N; 66°57'09"W
149	ME	Rd 366 93SP06	223, 37 NW	18°08'44"N; 66°57'09"W
150	ME	Rd 366 93SP06	326, 24 NE	18°08'44"N; 66°57'09"W
151	ME	Rd 366 93SP06	305, 87 NE	18°08'44"N; 66°57'09"W
152	ME	Rd 366 93SP06	129, 61 NE	18°08'44"N; 66°57'09"W
153	ME	Rd 366 93SP06	311, 40 NE	18°08'44"N; 66°57'09"W
154	ME	Rd 366 93SP06	267, 34 NW	18°08'44"N; 66°57'09"W
155	ME	Rd 366 93SP06	265, 68 NW	18°08'44"N; 66°57'09"W
156	ME	Rd 366 94SP06	311, 26 NE	18°08'46"N; 66°57'04"W
157	ME	Rd 366 94SP06	324, 52 NE	18°08'46"N; 66°57'04"W
158	ME	Rd 366 94SP06	354, 81 NE	18°08'46"N; 66°57'04"W
159	ME	Rd 366 94SP06	286, 50 NE	18°08'46"N; 66°57'04"W
160	ME	Rd 366 94SP06	313, 76 NE	18°08'46"N; 66°57'04"W
161	ME	Rd N OF366 96SP06	311, 88 NE	18°08'52"N; 66°57'04"W
162	ME	Rd N OF366 96SP06	209, 09 NW	18°08'52"N; 66°57'04"W
163	ME	Rd N OF366 96SP06	311, 28 SW	18°08'52"N; 66°57'04"W
164	ME	Rd N OF 366 97SP06	309, 21 NE	18°09'00"N; 66°57'04"W
165	ME	Rd N OF 366 97SP06	195, 48 SE	18°09'00"N; 66°57'04"W
166	ME	Rd N OF 366 97SP06	230, 75 SE	18°09'00"N; 66°57'04"W
167	ME	Rd N OF 366 97SP06	347, 57 NE	18°09'00"N; 66°57'04"W
168	ME	Rd N OF 366 97SP06	314, 30 NE	18°09'00"N; 66°57'04"W
169	ME	Rd N OF 366 97SP06	296, 30 NE	18°09'00"N; 66°57'04"W
170	ME	Rd N OF 366 97SP06	311, 50 NE	18°09'00"N; 66°57'04"W
171	ME	Rd N OF 366 97SP06	312, 86 NE	18°09'00"N; 66°57'04"W
172	ME	Rd N OF 366 98SP06	318, 35 NE	18°09'04"N; 66°57'01"W
173	ME	Rd N OF 366 98SP06	318, 55 NE	18°09'04"N; 66°57'01"W
174	ME	Rd N OF 366 100SP06	332, 68 NE	18°09'08"N; 66°57'00"W

175	ME	Rd N OF 366 100SP06	286, 68 SW	18°09'08"N; 66°57'00"W
176	ME	Rd N OF 366 100SP06	308, 86 NE	18°09'08"N; 66°57'00"W
177	ME	Rd 365 102SP06	303, 26 NE	18°06'17"N; 66°55'18"W
178	ME	Rd 365 102SP06	309, 26 NE	18°06'17"N; 66°55'18"W
179	ME	Rd 365 108SP06	283, 25 NE	18°06'11"N; 66°55'30"W
180	ME	Rd 365 108SP06	326, 58 NE	18°06'11"N; 66°55'30"W
181	ME	Rd 365 108SP06	267, 29 NW	18°06'11"N; 66°55'30"W
182	ME	Rd 365 108SP06	282, 88 NE	18°06'11"N; 66°55'30"W
183	ME	Rd 365 109SP06	272, 80 NE	18°06'08"N; 66°55'31"W
184	ME	Rd 365 109SP06	281, 60 NE	18°06'08"N; 66°55'31"W
185	ME	Rd 365 110SP06	310, 60 NE	18°06'06"N; 66°55'32"W
186	ME	Rd 365 111SP06	248, 44 NW	18°06'04"N; 66°55'36"W
187	ME	Rd 365 112SP06	260, 45 NW	18°05'56"N; 66°55'39"W
188	ME	Rd 365 113SP06	245, 23 NW	18°05'50"N; 66°59'37"W
189	ME	Rd 365 114SP06	315, 50 NE	18°05'48"N; 66°55'38"W
190	ME	Rd 365 114SP06	273, 88 SW	18°05'48"N; 66°55'38"W
191	ME	Rd 365 115SP06	284, 20 NE	18°05'45"N; 66°55'35"W
192	ME	Rd 365 115SP06	354, 53 SW	18°05'45"N; 66°55'35"W
193	ME	Rd 365 115SP06	240, 87 SE	18°05'45"N; 66°55'35"W
194	ME	Rd 365 115SP06	303, 12 NE	18°05'45"N; 66°55'35"W
195	ME	Rd 365 118SP06	297, 28 SW	18°04'47"N; 66°56'27"W
196	ME	Rd 365 119SP06	278, 50 NE	18°04'47"N; 66°56'27"W
197	ME	Rd 365 119SP06	300, 47 NE	18°04'47"N; 66°56'27"W
198	ME	Rd 364 121SP06	316, 37 NE	18°06'28"N; 66°56'11"W
199	ME	Rd 364 122SP06	290, 10 NE	18°06'23"N; 66°56'13"W
200	ME	Rd 364 122SP06	324, 38 NE	18°06'23"N; 66°56'13"W
201	ME	Rd 364 123SP06	299, 68 NE	18°06'05"N; 66°56'06"W
202	ME	Rd 364 124SP06	206, 19 SE	18°06'02"N; 66°56'10"W
203	ME	Rd 364 124SP06	330, 85 SW	18°06'02"N; 66°56'10"W
204	ME	Rd 364 124SP06	330, 32 SW	18°06'02"N; 66°56'10"W
205	ME	Rd 364 124SP06	343, 28 NE	18°06'02"N; 66°56'10"W
206	ME	Rd 364 124SP06	311, 45 NE	18°06'02"N; 66°56'10"W
207	ME	Rd 364 125SP06	226, 17 SE	18°05'56"N; 66°56'15"W
208	ME	Rd 364 126SP06	345, 30 NE	18°05'21"N; 66°56'53"W
209	ME	Rd 364 126SP06	358, 40 NE	18°05'21"N; 66°56'53"W
210	ME	Rd 362 127SP06	325, 46 NE	18°08'20"N; 66°58'09"W
211	ME	Rd 362 127SP06	330, 70 NE	18°08'20"N; 66°58'09"W
212	ME	Rd 362 128SP06	316, 35 NE	18°08'19"N; 66°58'11"W
213	ME	Rd 362 128SP06	288, 66 NE	18°08'19"N; 66°58'11"W
214	ME	Rd 362 128SP06	310, 87 NE	18°08'19"N; 66°58'11"W
215	ME	Rd 362 129SP06	277, 65 NE	18°08'16"N; 66°58'13"W
216	ME	Rd 362 133SP06	305, 25 SW	18°08'02"N; 66°58'16"W
217	ME	Rd 362 133SP06	330, 32 SW	18°08'02"N; 66°58'16"W
218	ME	Rd 362 133SP06	332, 23 SW	18°08'02"N; 66°58'16"W
219	ME	Rd 362 133SP06	252, 35 SE	18°08'02"N; 66°58'16"W
220	ME	Rd 362 140SP06	212, 62 SE	18°07'51"N; 66°58'59"W
221	ME	VEREDA DESCANSO 143SP06	337, 27 NE	18°09'22"N; 66°59'59"W

222	ME	VEREDA DESCANSO 144SP06	330, 45 SW	18°09'11"N; 67°00'34"W
223	ME	VEREDA DESCANSO 144SP06	295, 24 NE	18°09'11"N; 67°00'34"W
224	ME	VEREDA DESCANSO 145SP06	319, 43 SW	18°09'09"N; 67°00'34"W
225	ME	VEREDA DESCANSO 145SP06	327, 72 SW	18°09'09"N; 67°00'34"W
226	ME	VEREDA DESCANSO 145SP06	320, 78 SW	18°09'09"N; 67°00'34"W
227	ME	VEREDA DESCANSO 145SP06	308, 42 SW	18°09'09"N; 67°00'34"W
228	ME	VEREDA DESCANSO 145SP06	275, 17 SW	18°09'09"N; 67°00'34"W
229	ME	VEREDA DESCANSO 146SP06	326, 60 NE	18°09'07"N; 67°00'34"W
230	ME	VEREDA DESCANSO 146SP06	309, 70 NE	18°09'07"N; 67°00'34"W
231	ME	VEREDA DESCANSO 146SP06	270, 05 S	18°09'07"N; 67°00'34"W
232	ME	V. N OF DESCANSO 148SP06	331, 61 NE	18°09'51"N; 67°01'03"W
233	ME	V. N OF DESCANSO 149SP06	316, 40 NE	18°09'52"N; 67°01'11"W
234	ME	V. N OF DESCANSO 149SP06	330, 47 SW	18°09'52"N; 67°01'11"W
235	ME	V. N OF DESCANSO 150SP06	261, 53 SE	18°09'53"N; 67°01'12"W
236	ME	V. N OF DESCANSO 150SP06	225, 40 NW	18°09'53"N; 67°01'12"W
237	ME	V. N OF DESCANSO 150SP06	248, 60 NW	18°09'53"N; 67°01'12"W
238	ME	V. N OF DESCANSO 151SP06	316, 84 SW	18°09'52"N; 67°01'18"W
239	G	Rd 369 152SP06	352, 25 NE	18°03'23"N; 66°56'59"W
240	ME	Rd 371 157SP06	292, 20 NE	18°04'59"N; 66°53'15"W
241	ME	Rd 371 158SP06	331, 61 NE	18°04'57"N; 66°53'16"W
242	ME	Rd 371 158SP06	299, 66 NE	18°04'57"N; 66°53'16"W
243	ME	Rd 371 158SP06	318, 70 NE	18°04'57"N; 66°53'16"W
244	ME	Rd 371 159SP06	308, 76 NE	18°04'55"N; 66°53'18"W
245	ME	OFF Rd 371 162SP06	338, 82 SW	18°04'57"N; 66°53'14"W
246	ME	OFF Rd 371 162SP06	354, 89 NE	18°04'57"N; 66°53'14"W
247	ME	OFF Rd 371 162SP06	164, 86 NE	18°04'57"N; 66°53'14"W
248	ME	Rd 371 163SP06	271, 46 SW	18°04'37"N; 66°53'08"W
249	ME	Rd 371 163SP06	277, 87 NE	18°04'37"N; 66°53'08"W
250	ME	Rd 371 163SP06	300, 77 NE	18°04'37"N; 66°53'08"W
251	ME	Rd 371 163SP06	308, 72 NE	18°04'37"N; 66°53'08"W
252	ME	Rd 371 163SP06	310, 73 NE	18°04'37"N; 66°53'08"W
253	ME	Rd 371 163SP06	311, 52 NE	18°04'37"N; 66°53'08"W
254	ME	OFF Rd 368 165SP06	198, 84 SE	18°02'57"N; 66°53'47"W
255	ME	OFF Rd 368 165SP06	205, 84 SE	18°02'57"N; 66°53'47"W
256	ME	OFF Rd. 368 166SP06	214, 64 SE	18°02'49"N; 66°53'23"W
257	ME	OFF Rd. 368 167SP06	333, 58 NE	18°02'45"N; 66°53'17"W
258	ME	OFF Rd. 368 168SP06	318, 78 NE	18°03'24"N; 66°55'40"W
259	ME	OFF Rd. 368 168SP06	294, 84 NE	18°03'24"N; 66°55'40"W
260	ME	OFF Rd. 368 170SP06	232, 55 SE	18°03'29"N; 66°55'38"W
261	ME	OFF Rd. 368 171SP06	278, 22 NE	18°03'23"N; 66°55'43"W
262	ME	OFF Rd. 361 172SP06	293, 81 SW	18°08'28"N; 67°00'18"W
263	ME	OFF Rd. 361 174SP06	321, 88 NE	18°08'11"N; 67°00'33"W
264	ME	Rd. TO SUSUA OFF 368 177SP06	248, 40 NW	18°04'29"N; 66°55'50"W
265	ME	Rd. TO SUSUA OFF 368 177SP06	337, 55 SE	18°04'29"N; 66°55'50"W
266	ME	Rd. TO SUSUA OFF 368 177SP06	254, 55 SE	18°04'29"N; 66°55'50"W
267	ME	Rd. TO SUSUA OFF 368 177SP06	317, 77 SW	18°04'29"N; 66°55'50"W
268	ME	Rd. TO SUSUA OFF 368 178SP06	220, 24 NW	18°04'31"N; 66°55'46"W

269	ME	Rd. TO SUSUA OFF 368 178SP06	190, 27 SE	18°04'31"N; 66°55'46"W
270	ME	Rd. TO SUSUA OFF 368 178SP06	188, 35 NW	18°04'31"N; 66°55'46"W
271	ME	Rd. TO SUSUA OFF 368 178SP06	219, 50 NW	18°04'31"N; 66°55'46"W
272	ME	Rd. TO SUSUA OFF 368 178SP06	237, 33 NW	18°04'31"N; 66°55'46"W
273	ME	Rd. TO SUSUA OFF 368 179SP06	200, 13 NW	18°04'28"N; 66°55'45"W
274	ME	Rd. TO SUSUA OFF 368 179SP06	235, 47 NW	18°04'28"N; 66°55'45"W
275	ME	Rd. TO SUSUA OFF 368 180SP06	286, 87 SW	18°04'24"N; 66°55'41"W
276	ME	Rd. TO SUSUA OFF 368 181SP06	357, 40 SW	18°04'23"N; 66°55'39"W
277	ME	Rd. TO SUSUA OFF 368 181SP06	340, 77 NE	18°04'23"N; 66°55'39"W
278	ME	Rd. TO SUSUA OFF 368 181SP06	328, 80 NE	18°04'23"N; 66°55'39"W
279	ME	Rd. TO SUSUA OFF 368 182SP06	203, 12 NW	18°04'24"N; 66°55'37"W
280	ME	Rd. TO SUSUA OFF 368 183SP06	305, 18 SW	18°04'22"N; 66°55'34"W
281	ME	Rd. TO SUSUA OFF 368 183SP06	258, 13 SE	18°04'22"N; 66°55'34"W
282	ME	Rd. TO SUSUA OFF 368 183SP06	250, 09 NW	18°04'22"N; 66°55'34"W
283	ME	Rd. TO SUSUA OFF 368 185SP06	324, 05 NE	18°04'19"N; 66°55'25"W
284	ME	Rd. TO SUSUA OFF 368 185SP06	307, 18 SW	18°04'19"N; 66°55'25"W
285	ME	Rd. TO SUSUA OFF 368 186SP06	230, 15 NW	18°04'22"N; 66°55'22"W
286	ME	Rd. TO SUSUA OFF 368 186SP06	345, 10 SW	18°04'22"N; 66°55'22"W
287	ME	Rd. TO SUSUA OFF 368 187SP06	194, 45 SE	18°04'20"N; 66°55'19"W
288	ME	Rd. TO SUSUA OFF 368 189SP06	341, 27 NE	18°04'23"N; 66°55'05"W
289	ME	Rd. TO SUSUA OFF 368 190SP06	232, 24 NW	18°04'20"N; 66°55'03"W
290	ME	Rd. TO SUSUA OFF 368 191SP06	210, 03 NW	18°04'13"N; 66°54'53"W
291	ME	Rd. TO SUSUA OFF 368 191SP06	327, 22 NE	18°04'13"N; 66°54'53"W
292	ME	Rd. TO SUSUA OFF 368 191SP06	292, 50 NE	18°04'13"N; 66°54'53"W
293	ME	Rd. TO SUSUA OFF 368 191SP06	293, 44 NE	18°04'13"N; 66°54'53"W
294	ME	Rd. TO SUSUA OFF 368 192SP06	228, 39 NW	18°04'11"N; 66°54'50"W
295	ME	Rd. TO SUSUA OFF 368 193SP06	332, 05 NE	18°04'10"N; 66°54'49"W
296	ME	Rd. TO SUSUA OFF 368 193SP06	297, 11 NE	18°04'10"N; 66°54'49"W
297	ME	Rd. TO SUSUA OFF 368 194SP06	280, 22 NE	18°04'07"N; 66°54'48"W
298	ME	Rd. TO SUSUA OFF 368 195SP06	244, 34 SE	18°04'05"N; 66°54'45"W
299	ME	Rd. TO SUSUA OFF 368 195SP06	254, 05 SE	18°04'05"N; 66°54'45"W
300	ME	Rd. TO SUSUA OFF 368 195SP06	206, 37 NW	18°04'05"N; 66°54'45"W
301	ME	Rd. TO SUSUA OFF 368 198SP06	242, 18 SE	18°04'07"N; 66°54'41"W
302	ME	Rd. TO SUSUA OFF 368 198SP06	262, 22 SE	18°04'07"N; 66°54'41"W
303	ME	Rd. TO SUSUA OFF 368 200SP06	226, 15 NW	18°04'10"N; 66°54'38"W
304	ME	Rd. TO SUSUA OFF 368 202SP06	275, 22 SW	18°04'15"N; 66°54'39"W
305	ME	Rd. TO SUSUA OFF 368 209SP06	289, 20 SW	18°04'19"N; 66°54'30"W
306	ME	Rd. TO SUSUA OFF 368 211SP06	201, 28 NW	18°04'06"N; 66°54'21"W
307	ME	Rd. TO SUSUA OFF 368 211SP06	314, 12 SW	18°04'06"N; 66°54'21"W
308	ME	Rd. TO SUSUA OFF 368 211SP06	212, 11 NW	18°04'06"N; 66°54'21"W
309	ME	Rd. TO SUSUA OFF 368 212SP06	316, 03 SW	18°03'57"N; 66°54'13"W
310	ME	Rd. TO SUSUA OFF 368 212SP06	250, 30 SE	18°03'57"N; 66°54'13"W
311	ME	Rd. TO SUSUA OFF 368 215SP06	200, 10 NW	18°03'58"N; 66°53'49"W
312	ME	Rd. TO SUSUA OFF 368 215SP06	255, 02 NW	18°03'58"N; 66°53'49"W
313	ME	Rd. TO SUSUA OFF 368 216SP06	345, 54 NE	18°03'48"N; 66°53'49"W
314	ME	TRAIL N OF SUSUA 226SP06	224, 04 SE	18°04'32"N; 66°54'22"W
315	ME	TRAIL N OF SUSUA 227SP06	190, 22 SE	18°05'18"N; 66°54'30"W

316	ME	TRAIL N OF SUSUA 227SP06	138, 32 NE	18°05'18"N; 66°54'30"W
317	ME	TRAIL N OF SUSUA 230SP06	198, 38 NW	18°04'57"N; 66°54'31"W
318	ME	TRAIL N OF SUSUA 230SP06	310, 35 NE	18°04'57"N; 66°54'31"W
319	ME	TRAIL S OF SUSUA 231SP06	217, 88 NW	18°03'25"N; 66°54'18"W
320	ME	TRAIL S OF SUSUA 234SP06	299, 36 NE	18°03'33"N; 66°54'26"W
321	ME	TRAIL S OF SUSUA 234SP06	199, 27 SE	18°03'33"N; 66°54'26"W
322	ME	TRAIL S OF SUSUA 234SP06	199, 52 SE	18°03'33"N; 66°54'26"W
323	ME	RANCHERA TRAIL 241SP06	342, 30 NE	18°05'16"N; 66°53'51"W
324	ME	RANCHERA TRAIL 241SP06	308, 87 NE	18°05'16"N; 66°53'51"W
325	ME	RANCHERA TRAIL 241SP06	326, 88 NE	18°05'16"N; 66°53'51"W
326	ME	RANCHERA TRAIL 241SP06	137, 31 NE	18°05'16"N; 66°53'51"W
327	ME	Rd. S OF Rd. 105 245SP06	180, 44 E	18°10'28"N; 67°03'31"W
328	ME	Rd. S OF Rd. 105 246SP06	188, 53 NW	18°10'19"N; 67°03'32"W
329	ME	Rd. W OFF Rd. 3345 248SP06	262, 18 SE	18°10'38"N; 67°04'59"W
330	ME	Rd. W OFF Rd. 3345 248SP06	318, 83 NE	18°10'38"N; 67°04'59"W
331	ME	Rd. N OFF Rd. 348 252SP06	130, 56 NE	18°09'31"N; 67°03'02"W
332	ME	Rd. N OFF Rd. 348 253SP06	285, 22 NE	18°09'27"N; 67°03'05"W
333	ME	Rd. N OFF Rd. 348 253SP06	355, 58 NE	18°09'27"N; 67°03'05"W
334	ME	Rd. N OFF Rd. 348 253SP06	282, 88 NE	18°09'27"N; 67°03'05"W
335	ME	Rd. to NE OF Rd. 330 254SP06	166, 60 NE	18°09'44"N; 67°03'036"W
336	ME	Rd. to NE OF Rd. 330 254SP06	338, 50 NE	18°09'44"N; 67°03'036"W
337	ME	Rd. to NE OF Rd. 330 255SP06	322, 32 SW	18°09'46"N; 67°03'31"W
338	ME	Rd. to NE OF Rd. 330 255SP06	325, 53 NE	18°09'46"N; 67°03'31"W
339	ME	Rd. to NE OF Rd. 330 255SP06	295, 66 NE	18°09'46"N; 67°03'31"W
340	ME	Rd. to NE OF Rd. 330 255SP06	318, 87 SW	18°09'46"N; 67°03'31"W
341	ME	Rd. to NE OF Rd. 330 255SP06	318, 29 SW	18°09'46"N; 67°03'31"W
342	ME	Rd. to NE OF Rd. 330 256SP06	301, 34 SW	18°09'48"N; 67°03'30"W
343	ME	Rd. to NE OF Rd. 330 256SP06	256, 69 SE	18°09'48"N; 67°03'30"W
344	ME	Rd. TO SW OF Rd.105 257SP06	302, 57 NE	18°09'48"N; 67°03'30"W
345	ME	Rd. TO SW OF Rd.105 257SP06	316, 65 SW	18°11'26"N; 67°06'26"W
346	ME	Rd. TO SW OF Rd.105 257SP06	250, 76 SE	18°11'26"N; 67°06'26"W
347	ME	Q. PALMA GRANDE 260SP06	288, 87 NE	18°10'19"N; 67°02'54"W
348	ME	Q. PALMA GRANDE 261SP06	288, 88 SW	18°10'18"N; 67°02'53"W
349	ME	Q. PALMA GRANDE 264SP06	256, 65 NW	18°10'08"N; 67°02'41"W
350	ME	Rd. N OFF Rd.349 266SP06	302, 90	18°10'52"N; 67°05'20"W
351	ME	Rd. N OFF Rd.349 266SP06	303, 74 SW	18°10'52"N; 67°05'20"W
352	ME	TRAIL TO SALTO CURET 269SP06	300, 75 SW	18°09'53"N; 66°57'40"W
353	ME	TRAIL TO SALTO CURET 269SP06	296, 74 NE	18°09'53"N; 66°57'40"W
354	ME	TRAIL TO SALTO CURET 269SP06	310, 72 SW	18°09'53"N; 66°57'40"W
355	ME	RIO LAJAS 270SP06	277, 86 SW	18°09'53"N; 66°57'37"W
356	ME	RIO LAJAS 270SP06	331, 50 SW	18°09'53"N; 66°57'37"W
357	ME	RIO LAJAS 270SP06	312, 85 NE	18°09'53"N; 66°57'37"W
358	ME	RIO LAJAS 271SP06	274, 72 NE	18°09'52"N; 66°57'40"W
359	ME	TRAIL RIO LAJAS 273SP06	242, 40 SE	18°09'53"N; 66°57'37"W
360	ME	RIO LAJAS 274SP06	240, 67 NW	18°09'47"N; 66°57'21"W
361	G	Rd. 329 279SP06	311, 17 NE	18°03'03"N; 66°59'40"W
362	G	TRAIL OFF Rd. 329 280SP06	291, 86 NE	18°03'05"N; 66°59'41"W

363	G	TRAIL OFF Rd. 329 280SP06	276, 79 NE	18°03'05"N; 66°59'41"W
364	ME	PLANT. OFF Rd.366 284SP06	206, 77 SE	18°08'51"N; 66°57'02"W
365	ME	PLANT. OFF Rd.366 284SP06	278, 23 NE	18°08'51"N; 66°57'02"W
366	G	Rd. 362 288SP06	290, 55 NE	18°05'16"N; 67°01'26"W
367	G	Rd. 362 288SP06	300, 13 SW	18°05'17"N; 67°01'24"W
368	G	LA MOCA OFF Rd. 314 291SP06	314, 64 SW	18°04'50"N; 67°04'21"W
369	G	Rd. 314 292SP06	351, 43 SW	18°04'50"N; 67°04'17"W
370	G	T NW OFF Rd. 3362 293SP06	286, 70 SW	18°05'03"N; 67°00'46"W
371	G	T NW OFF Rd. 3362 293SP06	290, 86 SW	18°05'03"N; 67°00'46"W
372	G	T NW OFF Rd. 3362 293SP06	280, 86 NE	18°05'03"N; 67°00'46"W
373	ME	URB. COMP. Rd. 348 294SP06	306, 45 NE	18°11'30"N; 67°08'05"W
374	ME	URB. COMP. Rd. 348 294SP06	295, 45 NE	18°11'30"N; 67°08'05"W
375	ME	Rd. OFF Rd.349 295SP06	223, 40 NW	18°11'38"N; 67°07'58"W
376	ME	Rd. to S FROM Rd.349 296SP06	300, 75 NE	18°10'54"N; 67°06'36"W
377	ME	Rd. to S FROM Rd.349 296SP06	307, 26 NE	18°10'54"N; 67°06'36"W
378	ME	Rd. to S FROM Rd.349 296SP06	325, 58 NE	18°10'54"N; 67°06'36"W
379	ME	Rd. to S FROM Rd.349 296SP06	240, 22 NW	18°10'54"N; 67°06'36"W
380	ME	Rd. to S FROM Rd.349 296SP06	182, 73 NW	18°10'54"N; 67°06'36"W
381	ME	Rd. to S FROM Rd.349 296SP06	327, 68 NW	18°10'54"N; 67°06'36"W
382	ME	Rd. to S FROM Rd.349 296SP06	270, 50 N	18°10'54"N; 67°06'36"W
383	ME	Rio Bonelli 298SP06	297, 68 NE	18°09'58"N; 66°58'05"W
Foliations in Serpentinite (FS) SB 2005				
#	B.	Location	Orientation	GPS
1	ME	Rd. 3349 03SP05	309 55 NE	18°10'36"N; 67°05'57"W
2	G	Rd. 100 19S05	282 87 SW	18°07'47"N; 67°09'36"W
3	G	Rd. 100 19S05	285 90	18°07'47"N; 67°09'36"W
4	G	Rd.2 21S05	292 88 SW	18°05'39"N; 67°02'15"W
5	G	Rd. 2 25S05	280 50 NE	18°05'58"N; 67°02'42"W
Foliations in Serpentinite (FS) SUMMER 2005				
#	B.	Location	Orientation	GPS
1	G	El Hoyo	283, 75 NE	18°4'54"N; 67°4'44"W
2	G	El Hoyo	290, 66 NE	18°4'54"N; 67°4'44"W
3	G	El Hoyo	326, 70 NE	18°4'54"N; 67°4'44"W
4	G	Rd314 S off Rd 104	330, 55 NE	
5	G	Schoolbus Quarry	291, 90	
6	ME	Rd N of Rd368 to Susua	129, 49 NE	18°4'24"N; 66°56'13"W
7	ME	Rd N of Rd368 to Susua	312, 52 NE	18°4'24"N; 66°56'13"W
8	ME	Rd N of Rd368 to Susua	013, 10 SW	18°4'24"N; 66°56'13"W
9	ME	Rd N of Rd368 to Susua	338, 30 NE	18°4'24"N; 66°56'13"W
10	ME	Rd N of Rd368 to Susua	000, 10 E	18°4'24"N; 66°56'13"W
11	ME	Rd N of Rd368 to Susua	346, 27 NE	18°4'12"N; 66°54'38"W
12	ME	Rd N of Rd368 to Susua	018, 75 SE	18°4'19"N; 66°55'14"W
13	ME	Yauco Quarry Rd368	318, 72 SW	
14	ME	Yauco Quarry Rd368	121, 85 SW	
15	ME	Yauco Quarry Rd368	285, 83 SW	

16	ME	Yauco Quarry Rd368	058, 65 NW	
17	ME	Yauco Quarry Rd368	289, 86 SW	
18	ME	Yauco Quarry Rd368	075, 54 NW	
19	ME	Yauco Quarry Rd368	291, 83, NE	
20	ME	Yauco Quarry Rd368	270, 55 N	
21	ME	Yauco Quarry Rd368	092, 39 NE	
22	ME	Yauco Quarry Rd368	087, 50 NW	
23	ME	Yauco Quarry Rd368	284, 82 NE	
24	ME	Yauco Quarry Rd368	080, 50 NW	
25	ME	Yauco Quarry Rd368	070, 58 NW	
26	ME	Yauco Quarry Rd368	300, 42 NE	

A.4 DIKE ORIENTATIONS

Dikes 2006					
#	B.	Location	Orientation	Comments	GPS
1	ME	Rd 362 04SP06	231, 55 SE	mafic	18°7'13"N; 66°59'30"W
2	ME	Rd 120 73SP06	253, 61 SE	RODINGITE	18°9'29"N; 66°59'57"W
			301, 14 SW	RODINGITE	
3	ME	Rd 120 73SP06	249, 32 SE	RODINGITE	18°9'29"N; 66°59'57"W
4	ME	Rd 120 73SP06	320, 38 NE	ROD/MAFIC	18°9'29"N; 66°59'57"W
5	ME	Rd 364 124SP06	218, 25 SE	ROD; 40 CM THICK	18°06'02"N; 66°56'10"W
6	G	B Rd 114 AND Rd 347 154SP06	295, 40 SW	MAFIC	18°05'31"N; 67°03'42"W
7	G	B Rd 347 AND Rd 102 155SP06	242, 70 NW	DACITE	18°05'17"N; 67°03'00"W
8	G	Rd.2 ENT SAN GERMAN 267SP06	202, 31 SE	QTZ, HB?	18°05'20"N; 67°01'43"W
9	G	Rd. 314 292SP06	307, 26 NE	FLD-PYX/10 CM-1 M	18°04'50"N; 67°04'17"W
10	G	Rd. 314 292SP06	279, 83 NE	FLD-PYX/10 CM-1 M	18°04'50"N; 67°04'17"W
11	G	Rd. 314 292SP06	312, 53 NE	FLD-PYX/10 CM-1 M	18°04'50"N; 67°04'17"W
12	G	T NW OFF Rd. 3362 293SP06	271, 83 SW	MICROGAB. 1 M	18°05'03"N; 67°00'46"W
13	G	T NW OFF Rd. 3362 293SP06	326, 54 SW	MICROGAB.	18°05'03"N; 67°00'46"W
14	ME	Rio Bonelli 300SP06	316-270	FELSIC; STRIKE	18°09'56"N; 66°58'01"W
Dikes SUMMER 2005					
#	B.	Location	Orientation	Comments	GPS

1	G	BEACH 06S05	290 71 NE	RODINGITE?	18°09'58"N; 67°11'03"W
2	G	BEACH 06S05	297 55 SW	RODINGITE?	18°09'58"N; 67°11'03"W
3	G	Rd. 2 25S05	200 31 NW	RODINGITE?	18°05'58"N; 67°02'42"W
4	G	Rd. 2 25S05	287 73 SW	RODINGITE?	18°05'58"N; 67°02'42"W
5	G	Rd. 2 25S05	294 30 NE	RODINGITE?	18°05'58"N; 67°02'42"W
6	G	Rd. 2 25S05	270 87 N	RODINGITE?	18°05'58"N; 67°02'42"W

A.5 BASTITE FOLIATION IN SERPENTINITE

Bastite Foliations in Serpentinite 2006				
#	B.	Location	Orientation	GPS
1	ME	Rd 120 59SP06	198, 45 SE	18°8'44"N; 66°58'54"W
2	ME	Rd 120 59SP06	189, 68 SE	18°8'44"N; 66°58'54"W
3	ME	Rd 120 59SP06	332, 54 NE	18°8'44"N; 66°58'54"W
4	ME	Rd 120 59SP06	172, 72 NE	18°8'44"N; 66°58'54"W
5	ME	Rd 120 59SP06	198, 84 SE	18°8'44"N; 66°58'54"W
6	ME	Rd 120 59SP06	212, 68 SE	18°8'44"N; 66°58'54"W
7	ME	Rd 120 59SP06	215, 64 SE	18°8'44"N; 66°58'54"W
8	ME	Rd 120 60SP06	333, 60 NE	18°8'58"N; 66°58'55"W
9	ME	Rd 120 60SP06	308, 63 NE	18°8'58"N; 66°58'55"W
10	ME	Rd 120 64SP06	295, 42 NE	18°8'53"N; 66°59'23"W
11	ME	Rd 120 67SP06	177, 29 NE	18°9'16"N; 66°59'43"W
12	ME	Rd 120 67SP06	318, 38 NE	18°9'16"N; 66°59'43"W
13	ME	Rd 120 67SP06	328, 38 NE	18°9'16"N; 66°59'43"W
14	ME	Rd 120 70SP06	344, 44 SW	18°9'22"N; 66°59'53"W
15	ME	Rd 120 70SP06	236, 49 NW	18°9'22"N; 66°59'53"W
16	ME	Rd 120 73SP06	204, 80 SE	18°9'29"N; 66°59'57"W
17	ME	Rd 120 73SP06	197, 50 SE	18°9'29"N; 66°59'57"W
18	ME	Rd 362 85SP06	245, 90	18°08'31"N; 66°58'07"W
19	ME	Rd 366 87SP06	246, 44 SE	18°08'32"N; 66°57'34"W
20	ME	Rd 366 87SP06	255, 46 SE	18°08'32"N; 66°57'34"W
21	ME	Rd 366 87SP06	188, 23 NW	18°08'32"N; 66°57'34"W
22	ME	Rd 366 87SP06	181, 20 NW	18°08'32"N; 66°57'34"W
23	ME	Rd 366 87SP06	317, 53 NE	18°08'32"N; 66°57'34"W
24	ME	Rd 366 93SP06	300, 58 NE	18°08'44"N; 66°57'09"W
25	ME	Rd 366 93SP06	324, 83 NE	18°08'44"N; 66°57'09"W
26	ME	Rd 366 93SP06	322, 71 SW	18°08'44"N; 66°57'09"W
27	ME	Rd 366 93SP06	295, 65 NE	18°08'44"N; 66°57'09"W

28	ME	Rd 366 93SP06	297, 73 SW	18°08'44"N; 66°57'09"W
29	ME	Rd 366 93SP06	320, 78 SW	18°08'44"N; 66°57'09"W
30	ME	Rd 362 132SP06	266, 40 NW	18°08'05"N; 66°58'15"W
31	ME	Rd 362 132SP06	257, 33 NW	18°08'05"N; 66°58'15"W
32	ME	Rd 362 132SP06	242, 17 SE	18°08'05"N; 66°58'15"W
33	ME	Rd 362 132SP06	260, 10 SE	18°08'05"N; 66°58'15"W
34	ME	Rd. TO SUSUA OFF 368 194SP06	192, 57 SE	18°04'07"N; 66°54'48"W
35	ME	Rd. TO SUSUA OFF 368 194SP06	195, 54 SE	18°04'07"N; 66°54'48"W
36	ME	Rd. TO SUSUA OFF 368 215SP06	306, 83 NE	18°03'58"N; 66°53'49"W
37	ME	Rd. TO SUSUA OFF 368 215SP06	245, 90	18°03'58"N; 66°53'49"W
38	ME	Río Loco SUSUA TRAIL 218SP06	320, 85 SW	18°03'37"N; 66°53'32"W
39	ME	Río Loco SUSUA TRAIL 218SP06	312, 80 SW	18°03'37"N; 66°53'32"W
40	ME	TRAIL S OF SUSUA 238ASP06	344, 39 NE	18°03'57"N; 66°54'27"W
41	ME	TRAIL S OF SUSUA 238ASP06	350, 50 NE	18°03'57"N; 66°54'27"W

Bastite Foliations in Serpentinite SUMMER 2005

#	B.	Location	Orientation	GPS
1	G	BEACH 05S05	253 65 SE	18°09'59"N; 67°11'02"W
2	G	BEACH 05S05	253 68 SE	18°09'59"N; 67°11'02"W
3	G	BEACH 08S05	232 84 SE	18°09'53"N; 67°11'08"W
4	G	BEACH 08S05	260 84 SE	18°09'53"N; 67°11'08"W
5	G	BEACH 08S05	318 85 SW	18°09'53"N; 67°11'08"W
6	G	BEACH 17S05	306 41 SW	18°09'50"N; 67°11'08"W
7	G	BEACH 22S05	168 77 NE	18°09'48"N; 67°11'07"W
8	G	BEACH 22S05	203 70 SE	18°09'46"N; 67°11'07"W
9	G	BEACH 26S05	313 80 NE	18°09'36"N; 67°10'59"W

Bastite Foliations in Serpentinite SB 2005

#	B.	Location	Orientation	GPS
1	G	Coast	192, 55 SE	18°9'53"N; 67°11'8"W

A.6 BASTITE LINEATION IN SERPENTINITE

Bastite Lineations in Serpentinite 2006				
#	B.	Location	Orientation	GPS
1	G	Coast	08, 138	18°9'56"N; 67°11'5"W
Bastite Lineations in Serpentinite SUMMER 2005				
#	B.	Location	Orientation	GPS
1	G	BEACH 15S05	00 324	18°09'56"N; 67°11'06"W
2	G	BEACH 15S05	06 310	18°09'56"N; 67°11'06"W
Mineral Lineations in Serpentinite SB 2005				
#	B.	Location	Orientation	GPS
1	G	Coast	08, 138	18°9'56"N; 67°11'5"W
2	G	Coast	06, 326	18°9'56"N; 67°11'5"W
3	G	Coast	09, 140	18°9'56"N; 67°11'5"W
4	G	Coast	08, 142	18°9'56"N; 67°11'5"W
5	G	Coast	07, 323	18°9'56"N; 67°11'5"W
6	G	Coast	09, 129	18°9'56"N; 67°11'5"W
7	G	Coast	02, 149	18°9'56"N; 67°11'5"W
8	G	Coast	10, 135	18°9'56"N; 67°11'5"W
9	G	Coast	04, 147	18°9'56"N; 67°11'5"W
10	G	Coast	13, 159	18°9'56"N; 67°11'5"W

A.7 FOLD HINGES

Fold Hinges 2006					
#	B.	Location	Orientation	Axial Plane	GPS
1	ME	Rd 362 05SP06	16, 016		18°7'14"N; 66°59'23"W
2	ME	Rd 362 08SP06	09, 112		18°7'41"N; 66°59'13"W
3	ME	Rd 362 09SP06	07, 258		18°7'42"N; 66°59'12"W

4	ME	Rd 362 09SP06	11, 299		18°7'42"N; 66°59'12"W
5	ME	Rd 362 09SP06	27, 084		18°7'42"N; 66°59'12"W
6	ME	Rd 362 09SP06	18, 303		18°7'42"N; 66°59'12"W
7	ME	Rd 120 56SP06	36, 328		18°8'30"N; 66°58'12"W
8	ME	Rd 120 73SP06	39, 240		18°9'29"N; 66°59'57"W
9	ME	Rd 120 78SP06	40, 294		18°9'43"N; 66°59'43"W
10	ME	Rd 366 93SP06	33, 354	178, 75 SW	18°08'44"N; 66°57'09"W
11	G	Rd 369 152SP06	23, 059		18°03'23"N; 66°56'59"W
12	G	Rd 369 152SP06	05, 014		18°03'23"N; 66°56'59"W
13	G	Rd 369 152SP06	30, 028		18°03'23"N; 66°56'59"W
14	G	Rd 369 152SP06	55, 041		18°03'23"N; 66°56'59"W
15	G	Rd 369 152SP06	34, 027		18°03'23"N; 66°56'59"W
16	G	Rd 369 152SP06	59, 052		18°03'23"N; 66°56'59"W
17	G	Rd 369 152SP06	58, 041		18°03'23"N; 66°56'59"W
18	G	Rd 369 152SP06	35, 039		18°03'23"N; 66°56'59"W
19	ME	VEREDA DESCANSO 153SP06	04, 175		18°08'47"N; 67°01'13"W
20	ME	OFF Rd. 368 166SP06	47, 078		18°02'49"N; 66°53'23"W
21	ME	OFF Rd. 368 166SP06	22, 078		18°02'49"N; 66°53'23"W
22	ME	OFF Rd. 368 169SP06	01, 336	330, 72 NE	18°03'26"N; 66°55'39"W
23	ME	OFF Rd. 368 171SP06	23, 355	348, 78 NE	18°03'23"N; 66°55'43"W
24	ME	Rd. TO SUSUA OFF 368 200SP06	16, 319	318, 62 NE	18°04'10"N; 66°54'38"W
25	ME	TRAIL N OF SUSUA 230SP06	82, 030	216, 80 SE	18°04'57"N; 66°54'31"W
26	ME	TRAIL N OF SUSUA 230SP06	82, 334	205, 85 SE	18°04'57"N; 66°54'31"W
27	ME	TRAIL S OF SUSUA 231SP06	42, 201	293, 55 SW	18°03'25"N; 66°54'18"W
28	ME	Rd. S OF Rd. 105 247SP06	74, 192	197, 87 SE	18°10'22"N; 66°03'11"W
29	ME	Rd. N OFF Rd. 348 252SP06	70, 300	294, 85 SW	18°09'31"N; 67°03'02"W
30	ME	Rd. to NE OF Rd. 330 255SP06	12, 292	286, 67 SW	18°09'46"N; 67°03'31"W
31	G	Rd.2 ENT SAN GERMAN 267SP06	15, 126	309, 60 NE	18°05'20"N; 67°01'43"W
32	ME	PLANT. OFF Rd.366 284SP06	22, 041	218, 25 SE	18°08'51"N; 66°57'02"W
33	ME	PLANT. OFF Rd.366 284SP06	43, 185	300, 42 SW	18°08'51"N; 66°57'02"W
34	ME	PLANT. OFF Rd.366 284SP06	56, 213	296, 56 SW	18°08'51"N; 66°57'02"W
35	ME	PLANT. OFF Rd.366 284SP06	60, 123	235, 55 SE	18°08'51"N; 66°57'02"W
36	ME	PLANT. OFF Rd.366 284SP06	64, 129	242, 65 SE	18°08'51"N; 66°57'02"W
37	ME	PLANT. OFF Rd.366 284SP06	32, 098	186, 54 SE	18°08'51"N; 66°57'02"W
38	ME	Rd. to S FROM Rd.349 296SP06	27, 014	352, 44 NE	18°10'54"N; 67°06'36"W
39	ME	Rd. to S FROM Rd.349 296SP06	07, 332	332, 54 NE	18°10'54"N; 67°06'36"W
40	ME	Rd. to S FROM Rd.349 296SP06	43, 008	301, 50 NE	18°10'54"N; 67°06'36"W
41	ME	Rd. to S FROM Rd.349 296SP06	08, 306	320, 39 SW	18°10'54"N; 67°06'36"W
42		SM. WAY OFF RD. 349	39, 350	346, 72 NE	18°10'56"N; 67°06'57"W

		297SP06			
Fold Hinges SUMMER 2005					
#	B.	Location	Orientation	Axial Plane	GPS
1	G	Rd. 100 19S05	04 309		18°07'47"N; 67°09'36"W
Fold Hinges SB 2005					
#	B.	Location	Orientation	Axial Plane	GPS
1	ME	Yauco Quarry Rd368	13, 130		
2	ME	Yauco Quarry Rd368	12, 334		
3	ME	Yauco Quarry Rd368	17, 313		
4	ME	Yauco Quarry Rd368	03, 343		
5	ME	Yauco Quarry Rd368	07, 331		

A.8 VEINS WITHIN THE SERPENTINITE

Veins 2006						
#	B.	Location	Orientation	Thickness	Comments	GPS
1	ME	Rd 365 118SP06	292, 21 SW	1 CM	SERP.?	18°04'47"N; 66°56'27"W
2	ME	Rd 365 118SP06	264, 47 SE	5 CM	SERP.?	18°04'47"N; 66°56'27"W
3	G	TRAIL OFF Rd. 329 280SP06	313, 26 NE		QTZ	18°03'05"N; 66°59'41"W
4	G	TRAIL OFF Rd. 329 280SP06	280, 88 SW	2 CM	QTZ	18°03'05"N; 66°59'41"W
5	G	Q Rd.328 AND Rd.321 289SP06	218, 80 NW	7 CM	QTZ	18°03'57"N; 66°57'12"W
6	G	Q Rd.328 AND Rd.321 289SP06	250, 67 NW	3 CM	QTZ	18°03'57"N; 66°57'12"W
Veins SUMMER 2005						
#	B.	Location	Orientation	Thickness	Comments	GPS
1	G	BEACH 22S05	325 88 NE		SERP.	18°09'46"N; 67°11'07"W
2	G	BEACH 22S05	219 18 NW		SERP.	18°09'46"N;

					67°11'07"W
3	G	BEACH 22S05	184 35 SW	SERP.	18°09'46"N; 67°11'07"W
4	G	BEACH 22S05	200 51 NW	R?? SHEAR; SERP.	18°09'46"N; 67°11'07"W
5	G	BEACH 22S05	285 20 NE	SERP.	18°09'46"N; 67°11'07"W
6	G	BEACH 26S05	228 75 NW	SERP.	18°09'36"N; 67°10'59"W
7	G	BEACH 26S05	232 44 NW	SERP.	18°09'36"N; 67°10'59"W
8	G	BEACH 26S05	235 48 NW	SERP.	18°09'36"N; 67°10'59"W
9	G	BEACH 26S05	350 71 NE	SERP.	18°09'36"N; 67°10'59"W
10	G	BEACH 26S05	220 43 NW	SERP./S HEAR?	18°09'36"N; 67°10'59"W

A.9 CLEAVAGE

CLEAVAGE 2006

#	B.	Location	Orientation	Comments	GPS
1	ME	OFF Rd. 368 166SP06	265, 50 SE	WITHIN SAB. GRAN	18°02'49"N; 66°53'23"W
2	G	Rd. 329 278SP06	275, 30 NE	EL RAYO/FOLIATION	18°03'00"N; 66°59'37"W
3	G	Rd. 329 278SP06	245, 63 NW	EL RAYO/FOLIATION	18°03'00"N; 66°59'37"W
4	G	Rd. 329 278SP06	265, 40 NW	EL RAYO/FOLIATION	18°03'00"N; 66°59'37"W
5	G	Rd. 329 278SP06	260, 61 NW	EL RAYO/FOLIATION	18°03'00"N; 66°59'37"W
6	G	Rd. 329 278SP06	281, 56 NE	EL RAYO/FOLIATION	18°03'00"N; 66°59'37"W
7	G	Rd. 329 278SP06	242, 51 NW	EL RAYO/FOLIATION	18°03'00"N; 66°59'37"W
8	G	Rd. OFF Rd.318 290SP06	281, 72 NE	WITHIN SAB. GRAN	18°04'48"N; 67°03'44"W

APPENDIX B

THIN-SECTION DESCRIPTIONS

Petrographic descriptions made with the use of an optical microscope are presented in the following tables. Descriptions are grouped into serpentinized peridotite, sheared peridotite, and sedimentary serpentinite. Abbreviations are listed below:

C = C-plane

Cgl = Conglomerate

Chr = Chromite

Cont. = Contact (Serpentinite mass)

CPX = Clinopyroxene

exsol. = exsolution

G = Río Guanajibo

hem. = hematite

Int. = Internal (of Serpentinite mass)

ME = Monte del Estado

ol. = olivine

OPX = Orthopyroxene

outl. = outline

Porph. = Porhyritic

pres. = present

Prim. = Primary

S = S-plane

Sec. = Secondary

serp. = serpentinite

Sp. = Spinel

SS = sandstone

B.1 SERPENTINIZED PERIDOTITE

Thin Section:	YW368-6	**Grain size:**	<0.1-3.5mm	**Body or Form.:**	ME
Location:	18°01'16"N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	Contact
	66°52'40"W		Porph. Bastite	**Orientation:**	N/A
Rock:	Serpentinite				
Where sampled:	rock mass				
Prim. Mineralogy	**% Observed**	**% Alt.**	**Size (mm) min/max/avg**	**Morph.**	**Comments**
Serpentine	75		<0.1/0.4/0.2	Anhedral	ol. outl.pres.
Bastite	20		0.5/3.5/1	Anhedral	
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Magnetite	5	20	<0.1/0.5/0.1	Anhedral	to hem.?
Deformation:	Bastite: undulose extinction, kinked				
Serp. Veins cut texture, fibrous and interlocking					
Serp. Replacement from Pseud. to interlocking					
Fractures and faults cut texture and serp. Veins; Ribbon texture					

Thin Section:	05S05	**Grain size:**	0.1-10 mm	**Body or Form.:**	G
Location:	18°09'59N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	Internal
	067°11'01W		Porph. Bastite	**Orientation:**	N/A
Rock:	Serpentinite		CPX, Ol.		
Where sampled:	rock mass				
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Clinopyroxene	15	0	0.1/1.2/0.3	Anhedral	
Serpentine	60	100	0.2/1.5/0.4	Anhedral	
Bastite	20	85	0.5/10/4	Anhedral	
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Magnetite	5		0.1/1/0.3	Anhedral	
Deformation:	Bastite: undulose extinction, kinked				
slight foliation defined by concentration of crystals along planes					
Serp. Veins cut texture					
Fractures cut texture					

Thin Section:	18SP06	**Grain size:**		**Body or Form.:**	ME
Location:	18°09'42N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	Internal
	067°01'56W		Equigranular	**Orientation:**	N/A
Rock:	Serpentinite		with bastite		
Where sampled:	rock mass		porphyroclasts		
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Olivine	80	100	<-/-/0.2	Euhedral	recrys., 120° altered to serp.
Orthopyroxene	10	90	<-/3/1	Anhedral	altered to bastite
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Magnetite	5				to hem. in grain boundaries
Deformation:	Olivine and Bastite: undulose extinction				
subgrains in orthopyroxene					
Serp. Veins cut texture and porphyroclasts					
Highly fractured					

Thin Section:	19S05	**Grain size:**	<0.1-2.5 mm	**Body or Form.:**	G
Location:	18°07'47N	**Texture:**	Transitional	**Int. or Cont.:**	Contact
	067°09'36W		Poprphyritic Ol.	**Orientation:**	N/A
Rock:	Serpentinite		and bastite		
Where sampled:	rock mass				
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Serpentine	70	100	<0.1/2.5/0.7	Anhedral	Remnant ol shape
Bastite	10	100	0.5/2.5/1	Anhedral	
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Magnetite	20		<0.1/1.5/0.1	Anhedral	
Deformation:	Bastite: undulose extinction, kinked				
Serrate veins					
Interlocking replaces mesh texture					
Affected by high temperature?					

Thin Section:	38SP06 1	**Grain size:**	0.3-2 mm	**Body or Form.:**	ME
Location:	18°07'55N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	Interal
	066°57'28W		Equigranular	**Orientation:**	N/A
Rock:	Mass. Serp.		OPX phenocrysts		

Where sampled:	rock mass				
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Olivine	75	95	<-/-/0.3	Euh-Anhedral	120° GB, Relicts, recryst.
Orthopyroxene	8	95	<-/2/1	Sub-Anhedral	altered to bastite
Opaque brown?	10		<-/-/1		follows fabric
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Magnetite	5		<-/-/0.2	Anhedral	in grain boundaries
Deformation:	Serpentine: undulose extinction				
subgrains in orthopyroxene					
Olivine relicts are highly fractures					
Thin Section:	38SP06 2	**Grain size:**	0.1-3 mm	**Body or Form.:**	ME
Location:	18°07'55N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	Internal
	066°57'28W		Equigranular	**Orientation:**	N/A
Rock:	Serpentinite		OPX phenocrysts		
Where sampled:	rock mass				
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Olivine	70	95	<-/-/0.4	Euh-Subhedral	120° GB, Relicts, recryst.
Orthopyroxene	60	100	0.2/1.5/0.4	Anhedral	bastites
Clinopyroxene	20	85	0.5/10/4	Anhedral	
Brucite?	3		<-/-/0.3	Euhedral	radiating from magnetite
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Magnetite	10	50		Anhedral	in GB to hematite
Opaque brown?	5				
Deformation:	Serpentine: undulose extinction				
Serpentine veins					
Fracutred olivine					
Thin Section:	59SP06 1	**Grain size:**	0.05-8 mm	**Body or Form.:**	ME
Location:	18°08'44N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	Interal
	066°58'54W		Olivine and	**Orientation:**	334°, 61° SW sample
Rock:	Mass. Serp.		OPX phenocrysts		Bastite foliation
Where	rock mass				198°, 45° SE

sampled:					
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** **min/max/avg**	**Morphology**	**Comments**
Olivine	65	70	0.05/1/0.1	Anhedral	to serpentine
Orthopyroxene	20	80	0.1/8/2	Anhedral	altered to bastite
Clinopyroxene	5	5	0.1/0.5/0.2	Anhedral	to bastite and in exsolution
					lamellae in OPX
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** **min/max/avg**	**Morphology**	**Comments**
Magnetite	5	10	0.05/2/0.1	Anhedral	to hematite
Opaque brown	1		<-/3/-	Anhedral	chromite?, Spinel?
Deformation:	Mesh texture replaced by interlocking; Olivine: deformation lamellae, kinks,				
neoblasts; Bastite: undulose extinction, kinks; Serpentine veins					
Foliation defined by alternating layers of coarse bastite and fine-grained to coarse mesh texture					
Fault displaces (0.05 mm) of mesh rim					

<u>Thin Section:</u>	70SP06 1	**Grain size:**	0.05-6 mm	**Body or Form.:**	ME
Location:	18°09'22N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	Internal
	066°59'48W		Equant olivine	**Orientation:**	210°, 44° SE sample
Rock:	Serpentinite		OPX phenocrysts		Bastite foliation
Where sampled:	rock mass				236°, 49° NW
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** **min/max/avg**	**Morphology**	**Comments**
Olivine	75	95	0.05/0.3/0.1	Sub-Anhedral	Serp., some recryst.
Orthopyroxene	15	95	0.1/6/0.7	Anhedral	bastites
Clinopyroxene	1	0	<-/-/0.05 thick	Anhedral	exsol. Lam. in OPX
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** **min/max/avg**	**Morphology**	**Comments**
Magnetite	5	20	0.05/1/0.2	Anhedral	to hematite
Deformation:	Serpentine: undulose extinction; bastite: undulose extinction, kinks, deformation				
lamellae					
Serpentine veins cut bastites and mesh texture					
Bastite Foliation defined by layers of coarse bastite nd parallel long axes; ribbons parallel to foliation					

<u>Thin Section:</u>	85SP06	**Grain size:**	0.05-5 mm	**Body or Form.:**	ME
Location:	18°08'31N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	Interal
	066°58'07W		Olivine, OPX and	**Orientation:**	308°, 85° NE sample
Rock:	Mass. Serp.		CPX phenocrysts		
Where sampled:	rock mass		Bastite Foliation		

Prim. Mineralogy	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Olivine	70	90	0.05/1/0.3	Sub-Anhedral	serpentine, some relicts
Orthopyroxene	15	95	0.1/5/0.5	Anhedral	altered to bastite
Clinopyroxene	5	0	0.1/1/0.3	Anhedral	in exsol. lamellae in OPX
Amphibole?	1	0	<-/-/0.3	Subhedral	

Sec. Mineralogy	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Magnetite	5	30	0.05/2/0.5	Anhedral	in olivine GB and fractures

Deformation: Mesh texture replaced by interlocking

Bastite: undulose extinction, kinks; recrystallization overlaps mesh rims

Serpentine veins cut olivine, bastites

Strained coarse olivine grains

Thin Section:	93SP06 24	**Grain size:**	0.05-4 mm	**Body or Form.:**	ME
Location:	18°08'44N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	NE Contact
	066°57'07W		Equant olivine	**Orientation:**	298°, 83° SW sample
Rock:	Serpentinite		OPX phenocrysts		Bastite foliation
Where sampled:	rock mass				297°, 73° SW

Prim. Mineralogy	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Olivine	70	98	0.05/0.5/0.2	Subhedral	Serpentine
Orthopyroxene	15	95	0.1/4/1	Anhedral	bastites

Sec. Mineralogy	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Magnetite	10	25	0.05/1/0.4	Anhedral	Brown staining GB

Deformation: bastite: undulose extinction, kinks,fractured

Interlocking textures in some grains replacing mesh texture and bastite

Shear along serpentine veins

Thin Section:	85SP06	**Grain size:**	0.05-5 mm	**Body or Form.:**	ME
Location:	18°08'31N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	Interal
	066°58'07W		Olivine, OPX and	**Orientation:**	308°, 85° NE sample
Rock:	Mass. Serp.		CPX phenocrysts		
Where sampled:	rock mass		Bastite Foliation		

Prim. Mineralogy	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments

Olivine	70	90	0.05/1/0.3	Sub-Anhedral	serpentine, some relicts
Orthopyroxene	15	95	0.1/5/0.5	Anhedral	altered to bastite
Clinopyroxene	5	0	0.1/1/0.3	Anhedral	in exsol. lamellae in OPX
Amphibole?	1	0	<-/-/0.3	Subhedral	
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Magnetite	5	30	0.05/2/0.5	Anhedral	in olivine GB and fractures
Deformation:	Mesh texture replaced by interlocking				
Bastite: undulose extinction, kinks; recrystallization overlaps mesh rims					
Serpentine veins cut olivine, bastites					
Strained coarse olivine grains					
Thin Section:	93SP06 24	**Grain size:**	0.05-4 mm	**Body or Form.:**	ME
Location:	18°08'44N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	NE Contact
	066°57'07W		Equant olivine	**Orientation:**	298°, 83° SW sample
Rock:	Serpentinite		OPX phenocrysts		Bastite foliation
Where sampled:	rock mass				297°, 73° SW
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Olivine	70	98	0.05/0.5/0.2	Subhedral	Serpentine
Orthopyroxene	15	95	0.1/4/1	Anhedral	bastites
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Magnetite	10	25	0.05/1/0.4	Anhedral	Brown staining GB
Deformation:	bastite: undulose extinction, kinks,fractured				
Interlocking textures in some grains replacing mesh texture and bastite					
Shear along serpentine veins					
Thin Section:	93SP06 25	**Grain size:**	0.05-9 mm	**Body or Form.:**	ME
Location:	18°08'44N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	NE Contact
	066°57'07W		Equant olivine	**Orientation:**	230°, 49° SE sample
Rock:	Serpentinite		OPX phenocrysts		Bastite foliation
Where sampled:	rock mass				320°, 78° SW
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Olivine	80	100	0.05/0.5/0.1	Sub-Anhedral	Serpentine, prev. equig.
Orthopyroxene	15	90	0.2/9/1	Anhedral	bastites

Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Magnetite	5	10	0.05/1/0.2	Anhedral	Brown staining
Deformation:	bastite: undulose extinction				
Interlocking textures replacing mesh texture					
serpentine veins cut textures, veins are kinked; serpntine needles cut mesh texture					
<u>Thin Section:</u>	100SP06	**Grain size:**	0.05-2 mm	**Body or Form.:**	ME
Location:	18°09'08N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	Contact
	066°57'00W		some ribbons	**Orientation:**	N/A
Rock:	Serpentinite		Bastite phenocrysts		
Where sampled:	rock mass				
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Olivine	70	100	<-/-/0.1	Anhedral	Serpentine
Orthopyroxene	20	95	0.5/2/1.2	Sub-Anhedral	bastite
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Magnetite	10	10	0.05/1/0.1	Anhedral	in boundaries and cores
Deformation:	bastite: undulose extinction, kinks,bent				
Interlocking textures in some grains replacing mesh texture					
serpentine veins with dendritic (fern-like) pattern cut bastite and textures; fibrous					
<u>Thin Section:</u>	132SP06	**Grain size:**	0.05-5 mm	**Body or Form.:**	ME
Location:	18°08'05N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	Internal
	066°58'15W		Equigranular oliv.	**Orientation:**	N/A
Rock:	Serpentinite		OPX, Ol. Phen.		
Where sampled:	rock mass		Foliated		
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Olivine	85	50	0.05/0.3/0.1	Subhedral	Serpentine
Orthopyroxene	5	95	<-/5/2	Subhedral	bastites
Clinopyroxene	1	0	0.1/0.5/0.3	Acicular, Anhedral	Exsol. In OPX
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Magnetite	5	0	<-/-/0.2	Anhedral	
Deformation:	OPX: undulose extinction, bent				
Mesh rims and bastites oriented subparallel defining a foliation					

Olivines are relicts; various events of serpentine veining					
Thin Section:	137SP06	**Grain size:**	0.05-6 mm	**Body or Form.:**	ME
Location:	18°08'09N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	Internal
	066°58'43W		Equant olivine	**Orientation:**	N/A
Rock:	Serpentinite		bastite phenocrysts		
Where sampled:	rock mass				
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Olivine		98	<-/0.2/0.1	Subhedral	Serpentine, relicts
Orthopyroxene		90	0.6/6/1.8	Sub-Anhedral	bastites
Clinopyroxene		0	<-/0.3/0.2	Anhedral	grains and exsol. lam.
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Magnetite			0.05/0.3/0.1	Anhedral	Brown staining
Deformation:	bastite: undulose extinction, kinks,bent				
Serpentine: undulose extinction, kinked					
Serpentine veins cut all textures; spherulitic and dendritic habit					
Thin Section:	207SP06 a1	**Grain size:**	0.05-6 mm	**Body or Form.:**	ME
Location:	18°04'18N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	Internal
	066°54'32W		Equigranular oliv.	**Orientation:**	N/A
Rock:	Serpentinite		Porphiritic bastite		
Where sampled:	rock mass				
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Olivine	65	90	0.1/0.4/1	Sub-Anhedral	Serpentine, relicts
Orthopyroxene	20	80	0.2/6/3	Anhedral	bastites
Clinopyroxene	10	5	0.2/4/1	Anhedral	grains, exsol. lam.
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Magnetite	5	40	0.05/0.5/0.1	Anhedral	to hematite
Deformation:	OPX bastite: undulose extinction, kinks; CPX have undulose extinction and is bent				
fractured CPX and olivine, olivine neoblasts					
serpentine veins cut bastites and CPX					
Thin Section:	207SP06 b	**Grain size:**	0.05-6 mm	**Body or Form.:**	ME
Location:	18°04'18N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	Internal
	066°54'32W		Equigranular oliv.	**Orientation:**	N/A

Rock:	Serpentinite		Porphiritic bastite		
Where sampled:	rock mass				
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** **min/max/avg**	**Morphology**	**Comments**
Olivine	85	99	0.05/0.3/0.1	Eu-Subhedral	to Serp., recrsy. 120°
Orthopyroxene	10	95	0.2/6/0.5	Sub-Anhedral	bastites
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** **min/max/avg**	**Morphology**	**Comments**
Magnetite	5	60	0.05/4/0.1	Anhedral	Brown staining GB
Deformation:	bastite: undulose extinction, kinks,fractured				
Interlocking textures in some grains replacing mesh texture and bastite					
Shear along serpentine veins					
<u>Thin Section:</u>	221SP06	**Grain size:**	0.1-5 mm	**Body or Form.:**	ME
Location:	18°03'35N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	Internal
	066°53'30W		Porphyoclastic	**Orientation:**	N/A
Rock:	Serpentinite				
Where sampled:	rock mass				
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** **min/max/avg**	**Morphology**	**Comments**
Olivine	75	85	0.02/3/0.7	Anhedral	Porphyroclasts are relicts
Orthopyroxene	15	80	0.5/5/0.8	Sub-Anhedral	No relicts
Clinopyroxene	1	0	<-/-/0.1	Anhedral	Exsol. Lamellae
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** **min/max/avg**	**Morphology**	**Comments**
Magnetite	5	5	<-/2/0.1	Anhedral	to hematite
Deformation:	bastite: subgrains, kinks; relict olivine: subgrains, porphyroclasts are fractured				
serpentine veins cut olivine, pyroxenes					
<u>Thin Section:</u>	237SP06	**Grain size:**	0.1-0.3 mm	**Body or Form.:**	ME
Location:	18°03'45N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	Internal
	066°54'26W		Equigranular	**Orientation:**	N/A
Rock:	Serp. (dunite)				
Where sampled:	block within serp				
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** **min/max/avg**	**Morphology**	**Comments**
Olivine	95	100	0.1/0.3/0.2	Eu-Sub-Anhedral	to Serpentine
Sec.	**% Observed**	**% Altered**	**Size (mm)**	**Morphology**	**Comments**

Mineralogy			**min/max/avg**		
Magnetite	5	80	<-/0.3/0.1	Anhedral	to hematite
Deformation:	Undulose extinction in mesh cores and rims				
serpentine veins cut mesh texture; Thin section grades from brownish mesh rims to less altered yellow rims					
Thin Section:	251SP06	**Grain size:**	0.1-0.4 mm	**Body or Form.:**	ME
Location:	18°09'34N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	Internal
	067°02'53W		equigranular	**Orientation:**	N/A
Rock:	Serpentinite				
Where sampled:	Porphyroclast within serp				
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Olivine	80	99	0.01/0.3/0.2	Sub-Anhedral	Serpentine
Orthopyroxene	5	100	0.1/0.2/0.1	Sub-Anhedral	bastite
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Magnetite	15	20	0.1/0.4/0.2	Sub-Anhedral	to hematite
Deformation:	bastite: undulose extinction, kinks; serpentine: undulose extinction				
magnetite accumulation define a compositional foliation					
Thin Section:	254SP06 b	**Grain size:**	<0.1-3 mm	**Body or Form.:**	ME
Location:	18°09'44N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	Contact
	067°03'36W		Porphyritic bastite	**Orientation:**	N/A
Rock:	Serpentinite		interlocking in		
Where sampled:	contact with Yauco		some grains		
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Serpentine	64	100	<0.1/0.3/0.2	Anhedral	
Bastite	25	80	0.1/3/1	Anhedral	from OPX
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Magnetite	10		<0.1/1/0.2	Anhedral	in cores
Talc	1		0.1 thick	Anhedral	in veins
Deformation:	bastite: undulose extinction, kinks, bent				
serpentine veins	; interlocking texture suggests replacement				
Fault cuts serpentine veins; talc veins cut serpentine texture and bastite					
Thin Section:	279SP06 1	**Grain size:**	0.2-3 mm	**Body or Form.:**	G

Location:	18°03'03N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	Contact
	066°59'40W		Porphyritic bastite	**Orientation:**	N/A
Rock:	Serpentinite		equigranular oliv.		
Where sampled:	rock mass				
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Olivine	75	100	<-/-/0.3	Euhedral	serp., recryst, 120° GB
Orthopyroxene	12	95	0.2/2.5/0.5	Subhedral	Bastite
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Magnetite	10	10		Anhedral	to hematite
Deformation:	bastite: undulose extinction, bent; serpentine: undulose extinction				
serpentine veins cut olivine, pyroxenes; fractures, recrystallization					
Thin Section:	279SP06 2	**Grain size:**	0.1-2 mm	**Body or Form.:**	G
Location:	18°03'03N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	Contact
	066°59'40W		Porphyoclastic	**Orientation:**	N/A
Rock:	Serpentinite				
Where sampled:	rock mass				
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Olivine	75	100	0.1/0.6/0.3	Euhedral	serp., recryst, 120° GB
Orthopyroxene	12	85	0.1/2/0.5	Sub-Anhedral	bastite
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Magnetite	10	25		Anhedral	to hematite
Deformation:	bastite: undulose extinction, kinked, bent; serpentine: undulose extinction				
serpentine veins cut olivine, pyroxenes; recrystallization					
Thin Section:	284SP06 A1	**Grain size:**	<0.1-1.5 mm	**Body or Form.:**	ME
Location:	18°08'51N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	Contact
	066°57'02W			**Orientation:**	N/A
Rock:	Serpentinite				
Where sampled:	clast within sheared serp				
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Serpentine	88	100	<0.1/0.6/0.2	Anhedral	
Bastite	2	100	<-/-/0.5	Anhedral	interlocking texture

Sec. Mineralogy	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Magnetite	10	60	<0.1/1.5/0.1	Anhedral	to hematite

Deformation:	Previously dunite, undulose extinction in mesh rims
preferred orientation of elongated mesh texture (ribbons) defines foliation	

Thin Section:	284SP06 B	**Grain size:**	0.1-0.8 mm	**Body or Form.:**	ME
Location:	18°08'51N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	Contact
	066°57'02W			**Orientation:**	N/A
Rock:	Serpentinite				
Where sampled:	clast within sheared serp				

Prim. Mineralogy	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Serpentine	94		0.1/0.5/0.3	Anhedral	in mesh texture
Bastite	1		<-/0.8/0.4	Anhedral	replaced by platy serp

Sec. Mineralogy	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Magnetite	5		<0.1/0.8/0.1	Anhedral	in cores and rims

Deformation:	Previously dunite, undulose extinction in mesh rims
serpentine veins cut texture	

Thin Section:	289SP06 Ca	**Grain size:**	<0.1-4 mm	**Body or Form.:**	G
Location:	18°03'57N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	Contact
	066°57'12W		and Interlocking	**Orientation:**	N/A
Rock:	Serpentinite				
Where sampled:	rock mass				

Prim. Mineralogy	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Serpentine	50	100	<0.1/0.5/0.2	Anhedral	
Bastite	15	90	<-/4/1	Subhedral	

Sec. Mineralogy	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Magnetite	5	30	<-/1/0.2	Anhedral	
Calcite	30	70	<-/-/0.4	Anhedral	

Deformation:	bastite: undulose extinction, kinked, bent
Calcite veins cut serpentinite	

Thin Section:	294SP06 C	**Grain size:**	0.1-3 mm	**Body or Form.:**	ME
Location:	18°11'30N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	Contact
	067°08'05W		Porphyritic bastite	**Orientation:**	N/A
Rock:	Serpentinite		equant olivine		
Where sampled:	clast within breccia				
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Serpentine	80	100	0.2/0.4/0.3	Sub-Anhedral	Equant
Bastite	10	95	0.2/3/1	Anhedral	
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Magnetite	10	5	<-/-/0.1	Anhedral	hematite
Deformation:	bastite: undulose extinction				
Interlocking texture replaces mesh texture and bastites					

Thin Section:	294SP06 D	**Grain size:**	0.05-3 mm	**Body or Form.:**	ME
Location:	18°11'30N	**Texture:**	Pseudomorphic	**Int. or Cont.:**	Contact
	067°08'05W		Porphyritic bastite	**Orientation:**	N/A
Rock:	Serpentinite		equant olivine		
Where sampled:	clast within breccia				
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Olivine	65	100	0.1/1/0.3	Sub-Euhedral	serpentine
Orthopyroxene	20	100	0.1/3/0.4	Anhedral	bastite
Clinopyroxene	1	0	0.05 thick	thin, acicular	exsol. Lamellae of OPX
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Magnetite (chromite)	14		<-/-/0.2	Anhedral	Deep brown in center
Deformation:	bastite: undulose extinction				
Serpentine veins cut bastite and mesh texture					

B.2 SHEARED SERPENTINITE

Thin Section:	HOY1L	**Grain size:**	<0.1-15 mm	**Body or Form.:**	G
Location:	18°05'14"N	**Texture:**	Foliated	**Int. or Cont.:**	Contact
	66°59'56"W		S-C structures	**Orientation:**	266°, 69° NW foliation
Rock:	Serpentinite				N59W lineatio on foliat.
Where sampled:	rock mass				
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)**	**Morphology**	**Comments**
			min/max/avg		
Serpentine	80		<0.1/2/0.2	Anhedral	
Bastite	15		<0.1/15/0.2	Anhedral	
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)**	**Morphology**	**Comments**
			min/max/avg		
Magnetite	5		<0.1/1/0.1	Anhedral	on C-planes
Deformation:	bastite: undulose extinction; S-C structures; faults cut texture; mantled serpentine "fish"				
Interlocking texture and mesh texture in resistant clasts; foliation defined by elongate serpentine and bastites					
Thin Section:	HOY2L	**Grain size:**	<0.1-1 mm	**Body or Form.:**	G
Location:	18°05'14"N	**Texture:**	Foliated	**Int. or Cont.:**	Contact
	66°59'56"W		S-C structures	**Orientation:**	274°, 74° NE foliation
Rock:	Serpentinite				N57E on foliation plane
Where sampled:	rock mass				
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)**	**Morphology**	**Comments**
			min/max/avg		
Serpentine	85		<0.1/0.3/0.1	Anhedral	
Bastite	10		<0.1/0.4/0.1	Anhedral	
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)**	**Morphology**	**Comments**
			min/max/avg		
Magnetite	5		<0.1/1/0.1	Anhedral	participates in deform.
Deformation:	bastite: undulose extinction, kinked; S-C structure, pieces with ribbon and mesh textures				
preserved within foliation; faults cut texture; foliation defined by elongate serpentine and bastite.					
Folded foliation.					
Thin Section:	HOY3S	**Grain size:**	<0.1-1 mm	**Body or Form.:**	G
Location:	18°05'14"N	**Texture:**	Foliation	**Int. or Cont.:**	Contact
	66°59'56"W		S-C structure	**Orientation:**	265°, 79° SE foliation

Rock:	Serpentinite				
Where sampled:	rock mass				
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Serpentine	85		<0.1/0.4/0.2	Anhedral	
Bastite	5		0.1/0.4/0.3	Anhedral	
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Magnetite	10		<0.1/1/0.1	Anhedral	participates in deform.
Deformation:	bastite: undulose extinction; S-C structure; pieces with preserved mesh texture; foliation defined by elongated serpentine. Serpentine veins (fibrous) cut texture.				

Thin Section:	YW368Q-1d	**Grain size:**	<0.1-4 mm	**Body or Form.:**	ME
Location:	18°01'16"N	**Texture:**	Transitional	**Int. or Cont.:**	Contact
	66°52'40"W		Interlocking		N/A
Rock:	Serpentinite		Porphyritic Bastite		
Where sampled:	rock mass		Foliation		
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Serpentine			<0.1/0.3/0.2	Anhedral	
Bastite			0.1/4/1	Anhedral	
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Magnetite			<0.1/0.5/0.2	Anhedral	participates in deform.
Deformation:	bastite: undulose extinction, kinked, folded; faint S-C structure cut by faults; Foliation defined by elongated bastite and serpentine. Serpentine veins (fibrous) cut texture. Interlocking replaces pseudomorphic textures. "Fern-like" serpentine veins.				

Thin Section:	HOY3d	**Grain size:**	<0.1-2 mm	**Body or Form.:**	G
Location:	18°05'14"N	**Texture:**	Foliation	**Int. or Cont.:**	Contact
	66°59'56"W		S-C structure	**Orientation:**	265°, 79° SE foliation
Rock:	Serpentinite		Pseudomorphic		
Where sampled:	rock mass		in places		
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Serpentine	90		<0.1/1/0.3	Anhedral	
Bastite	5		0.1/2/0.5	Anhedral	
Sec.	**% Observed**	**% Altered**	**Size (mm)**	**Morphology**	**Comments**

Mineralogy			Size (mm) min/max/avg		
Magnetite	5		<0.1/1/0.1	Anhedral	participates in deform.
Deformation:	bastite: undulose extinction; S-C structure; pieces with preserved mesh texture.				
Faults cut texture. Serpentine veins (fibrous) cut texture.					
Thin Section:	YW368Q-1s	**Grain size:**	<0.1-3.5 mm	**Body or Form.:**	ME
Location:	18°01'16"N	**Texture:**	Transitional	**Int. or Cont.:**	Contact
	66°52'40"W		Interlocking	**Orientation:**	N/A
Rock:	Serpentinite		Porphyritic Bastite		
Where sampled:	rock mass		Foliation		
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Serpentine	80	100	<0.1/0.2/0.1	Anhedral	
Bastite	10	100	0.3/3.5/0.6	Anhedral	
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Magnetite	10	0	<0.1/1/0.1	Anhedral	
Deformation:	serpentine and bastite: undulose extinction; faint S-C structure; Fractures cut serpentine veins				
foliation defined by elongated serpentine and bastite. Interlocking replaces pseudomorphic texture.					
Thin Section:	YW368Q-2s	**Grain size:**	<0.1-1 mm	**Body or Form.:**	ME
Location:	18°01'16"N	**Texture:**	Foliation	**Int. or Cont.:**	Contact
	66°52'40"W		Folded	**Orientation:**	325°, 43° NE foliation
Rock:	Serpentinite		S-C structures		
Where sampled:	rock mass				
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Serpentine	90		<0.1/0.3/0.1	Anhedral	
Bastite	5		0.2/1/0.5	Anhedral	
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Magnetite	5		<0.1/0.6/0.1	Anhedral	participates in deform.
Deformation:	bastite: undulose extinction; S-C structure; Fractures cut serpentine veins; foliation is folded.				
foliation defined by elongated serpentine and bastite. Pieces of ribbon texture.					
Thin Section:	YW368Q-2d	**Grain size:**	<0.1-1.2 mm	**Body or Form.:**	ME

Location:	18°01'16"N	**Texture:**	Foliation	**Int. or Cont.:**	Contact
	66°52'40"W		S-C structures	**Orientation:**	325°, 43° NE
Rock:	Serpentinite				
Where sampled:	rock mass				
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Serpentine	90		<0.1/0.3/0.2	Anhedral	
Bastite	5		0.1/1.2/0.5	Anhedral	
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Magnetite	5		<0.1/0.6/0.3	Anhedral	
Deformation:	bastite: undulose extinction, kinked; S-C structure; Fractures cut serpentine veins				
foliation defined by elongated serpentine and bastite. Pieces of pseudomorphic texture.					
Thin Section:	YW368Q-3d	**Grain size:**	<0.1-0.3 mm	**Body or Form.:**	ME
Location:	18°01'16"N	**Texture:**	Foliated	**Int. or Cont.:**	Contact
	66°52'40"W		S-C structures	**Orientation:**	295°, 56° NE
Rock:	Serpentinite		Nonpseudomorphic		
Where sampled:	rock mass		(Interlocking)		
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Serpentine	85	100	<0.1/0.1/0.05	Anhedral	very fine grained
Bastite	5	100	0.05/0.3/0.1	Anhedral	
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Magnetite	10	0	<0.1/2/0.1	Anhedral	
Deformation:	bastite: undulose extinction, kinked, folded; S-C structure; Many thin serpentine veins.				
foliation defined by elongated serpentine and bastite. Interlocking replaces pseudomorphic texture.					
Thin Section:	YW368Q-4d	**Grain size:**	<0.1-2 mm	**Body or Form.:**	ME
Location:	18°01'16"N	**Texture:**	Transitional	**Int. or Cont.:**	Contact
	66°52'40"W		Interlocking	**Orientation:**	300°, 47° NE foliation
Rock:	Serpentinite		Foliation		
Where sampled:	rock mass				
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Serpentine	85	100	<0.1/0.2/0.1	Anhedral	
Bastite	10	95	0.3/2/0.5	Anhedral	

Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** **min/max/avg**	**Morphology**	**Comments**
Magnetite	5	10	<0.1/1.2/0.1	Anhedral	
Deformation:	bastite: undulose extinction, kinked; S-C structure; Fractures cut serpentine veins				
"fern-like" and fibrous serpentine veins. Interlocking replaces pseudomorphic texture. Dark clay? Mixed with					
serpentine.					
Thin Section:	167SP06 X	**Grain size:**	0.1-5 mm	**Body or Form.:**	ME
Location:	18°02'45"N	**Texture:**	Transitional	**Int. or Cont.:**	Contact
	066°53'17"W			**Orientation:**	333°, 58° NE foliation
Rock:	Serpentinite				
Where sampled:	rock mass				
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** **min/max/avg**	**Morphology**	**Comments**
Serpentine	73	100	<-/-/0.5	Sub-Anhedral	bladed, mesh
Orthopyroxene	15	100	0.2/5/1	Anhedral	bastite
Amphibole	1	100	<-/-/0.4	Anhedral	
Talc	1		<-/-/0.3	Anhedral	
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** **min/max/avg**	**Morphology**	**Comments**
Magnetite	10		<-/-/0.2	Anhedral	
Deformation:	bastite: undulose extinction, elongated, kinked; pieces with preserved mesh texture; foliation				
defined by elongated serpentine and bastites. Interlocking replaceing mesh texture. Serrate veins.					
Thin Section:	167SP06 y	**Grain size:**	<0.1-4 mm	**Body or Form.:**	ME
Location:	18°02'45"N	**Texture:**	Transitional	**Int. or Cont.:**	Contact
	066°53'17"W		Foliation	**Orientation:**	333°, 58° NE
Rock:	Serpentinite		Porphyroclastic		
Where sampled:	rock mass		bastites		
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** **min/max/avg**	**Morphology**	**Comments**
Serpentine	73	100	<-/1/0.4	Sub-Anhedral	mesh and elongated
Orthopyroxene	15	98	<-/4/1	Anhedral	bastite, elongated
Chromite? Sp	1	0	0.1/0.3/0.4	Anhedral	grey, high relief
Talc	1	0	<-/-/0.2	Anhedral	
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** **min/max/avg**	**Morphology**	**Comments**
Magnetite	10		<-/-/0.2	Anhedral	

Deformation:	bastite: undulose extinction, kinked, elongated, bended; Interlocking replaces mesh texture;				
foliation defined by elongated serpentine. Serpentine veins. Mantled serpentine with interlocking texture.					
Fractures.					
Thin Section:	169SP06 X	**Grain size:**	<0.05-1 mm	**Body or Form.:**	ME
Location:	18°03'26"N	**Texture:**	Foliation	**Int. or Cont.:**	Contact
	066°55'39"W		S-C structure	**Orientation:**	280°, 36° NE C-plane
Rock:	Serpentinite		Nonpseudmorphic		332°, 79° NE S-plane
Where sampled:	S-C structure				
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Serpentine	80	100	0.1/1/0.3	Anhedral	
Bastite	5		<-/0.1/0.5	Anhedral	
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Magnetite	15		0.05/1/0.2	Eu-Anhedral	
Deformation:	bastite: undulose extinction, kinked, elongated; S-C structure; Serpentine is elongated				
Mantled magnetite grains. S defined by elongate serpentine and bastite..					
Thin Section:	170SP06 ay1	**Grain size:**	0.05-3 mm	**Body or Form.:**	ME
Location:	18°03'29"N	**Texture:**	Slight Foliation	**Int. or Cont.:**	Contact
	066°55'38"W		Mesh texture	**Orientation:**	227°, 24° NW C-plane
Rock:	Serpentinite		Porphyritic bastite		280°, 70° NE S-plane
Where sampled:	S-C structure				Top to SW
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Serpentine	74	100	<-/0.5/0.1	Anhedral	
Bastite	10	100	0.2/3/1	Anhedral	from OPX
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Magnetite	15	0	0.05/1/0.2	Anhedral	
Chr-Spinel?	<1	0	<-/-/0.1	Subhedral	
Talc	<1		0.2 thick	Anhedral	in veins
Deformation:	bastite: undulose extinction; fractures cut veins; pieces with preserved mesh texture; foliation				
defined by elongated serpentine. Serpentine and talc veins.					
Thin Section:	179SP06 1	**Grain size:**	0.05-1 mm	**Body or Form.:**	ME
Location:	18°03'29"N	**Texture:**	Interpenetrating	**Int. or Cont.:**	Internal

	066°55'38"W		foliated	**Orientation:**	200°, 13° NW C-plane
Rock:	Serpentinite		Nonpseudomorphic		
Where sampled:	rock mass				
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Serpentine	90	100	<-/-/0.2	Anhedral	Antigorite?
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Magnetite	5	5	<-/1/0.3	Anhedral	
Chr-Spinel?	<1	0	<-/-/0.05	Subhedral	
Talc	1	0		Anhedral	
Bastite	2	100	<-/0.5/0.3	Anhedral	
Deformation:	Many fractures; oxidized veins (orange stain).				
Foliation defined by elongated serpentine blades.					
Thin Section:	179SP06 11	**Grain size:**	0.05-3 mm	**Body or Form.:**	ME
Location:	18°03'29"N	**Texture:**	foliated	**Int. or Cont.:**	Internal
	066°55'38"W		Nonpseudomorph.	**Orientation:**	320°, 15° SW C-plane
Rock:	Serpentinite				207°, 30° NW S-plane
Where sampled:	S-C structure				Top to SW
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Serpentine	85	100	<-/0.3/0.1	Anhedral	foliated
Bastite	5	100	<-/3/0.5	Anhedral	elongated
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Magnetite	5	20	0.05/1.5/0.1	Sub-Anhedral	
Talc	2	0	<-/1.2/0.3	Anhedral	Bent, kinked
Chr-Spinel?	1	0	<-/-/0.05	Subhedral	
Deformation:	bastite: undulose extinction, kinked; fractures; S-C structures, C defined by faults; S defined				
by aligned and elongated bladed serpentine; elongated masses of less deformed serp. Follows foliation.					
Thin Section:	179SP06 2x2	**Grain size:**	0.05-0.8 mm	**Body or Form.:**	ME
Location:	18°03'29"N	**Texture:**	Foliation	**Int. or Cont.:**	Internal
	066°55'38"W		Interpenetrating	**Orientation:**	185°, 25° NW C-plane
Rock:	Serpentinite		Nonpseudomorphic		224°, 54° NW S-plane
Where sampled:	rock mass C-S				Top to S
Prim.	**% Observed**	**% Altered**	**Size (mm)**	**Morphology**	**Comments**

Mineralogy			min/max/avg		
Serpentine	84	100	0.05/0.2/0.1	Anhedral	bladed and in mesh
Bastite	5	100	0.1/0.8/0.3	Anhedral	from OPX

Sec. Mineralogy	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Magnetite	10		0.05/0.6/0.08	Sub-Anhedral	fol. around grains
Talc	1	0	<-/-/0.3	Anheral	

Deformation: bastite: undulose extinction, kinked, elongated; S-C structure; folded foliation; S foliation defined by elongated and aligned blades of serpentine. Fractures and Serpentine veins.

Thin Section:	179SP06 2y1	**Grain size:**	0.05-1 mm	**Body or Form.:**	ME
Location:	18°03'29"N	**Texture:**	Foliation	**Int. or Cont.:**	Internal
	066°55'38"W		Interpenetrating	**Orientation:**	185°, 25° NW C-plane
Rock:	Serpentinite		Nonpseudomorphic		224°, 54° NW S-plane
Where sampled:	rock mass C-S		Interlocking		Top to S

Prim. Mineralogy	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Serpentine	85	100	<-/-/0.2	Anhedral	
Bastite	2	100	<-/1/0.5	Anhedral	

Sec. Mineralogy	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Magnetite	10	15	0.05/1/0.8	Anhedral	
Talc	1	0	<-/-/0.3	Anhedral	
Chr-Spinel?	1	0	<-/-/0.3	Sub-Anhedral	

Deformation: bastite: undulose extinction, elongated; S-C structure; folded foliation; foliation defined by elongated and aligned blades of serpentine. Fractures and Serpentine veins. Serrate Veins. Interpenetrating replaces interlocking texture

Thin Section:	248SP06 x	**Grain size:**	<0.1-3 mm	**Body or Form.:**	ME
Location:	18°10'38"N	**Texture:**	Foliation	**Int. or Cont.:**	Contact
	067°04'59"W		Interlocking	**Orientation:**	318°, 83° NE foliation
Rock:	Serpentinite		Nonpseudomorphic		
Where sampled:	rock mass				

Prim. Mineralogy	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Serpentine	68	100	<0.1/0.5/0.1	Anhedral	elongated
Bastite	15	95	0.1/3/0.2	Anhedral	from OPX, elongated

Sec. Mineralogy	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Magnetite	15		<0.1/1.5/0.1	Anhedral	participates in deform.
Talc	1	0	<-/-/0.1	Anhedral	
Chlorite?	<1	0	<-/-/0.4	Anhedral	

Deformation: bastite: undulose extinction, kinked, folded;Interlocking replaces pseudomorphic; foliation defined by elongated serpentine. Serpentine fibers and fractures.pieces with preserved mesh texture.

Thin Section:	249SP06 2	**Grain size:**	<0.1-1 mm	**Body or Form.:**	ME
Location:	18°10'32"N	**Texture:**	Foliation	**Int. or Cont.:**	Contact
	067°04'55"W		S-C structure	**Orientation:**	250°, 17° SE C-plane
Rock:	Serpentinite		Nonpseudomorphic		228°, 62° SE S-plane
Where sampled:	rock mass C-S		Porphyritic bastite		Top to N

Prim. Mineralogy	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Serpentine	85	100	<0.1/1/0.1	Anhedral	elongated
Bastite	5	100	0.3/2/0.6	Anhedral	elongated

Sec. Mineralogy	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Magnetite	10	5	<0.1/1/0.3	Anhedral	elongated

Deformation: bastite: undulose extinction, elongated, mantled "fish"; mantled Magnetite; mylonite; S-C. foliation defined by elongated serpentine. Interpenetrating replaces pseudomorphic in mantled porphyroblast. C-C' foliation; interlocking texture in some crystals, serrate veins; fractures along C-planes.

Thin Section:	254SP06 x2	**Grain size:**	<0.1-2 mm	**Body or Form.:**	ME
Location:	18°09'44"N	**Texture:**	Foliation	**Int. or Cont.:**	Contact
	067°03'36"W		S-C structure	**Orientation:**	342°, 48° NE C-plane
Rock:	Serpentinite		Nonpseudomorphic		225°, 17° SE S-plane
Where sampled:	rock mass		Interlocking		Top to E

Prim. Mineralogy	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Serpentine	60	0	<-/-/0.1	Anhedral	elongated
Bastite	5	0	<-/0.6/0.1	Anhedral	
Magnetite	30	0	<0.1/2/0.1	Anhedral	elongated, mantled

Sec. Mineralogy	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Brown Isotropic	5	0	<-/1/0.2	Anhedral	

Deformation:	bastite: undulose extinction; S-C structure; Faults cut folded foliations; foliation defined by elongated serpentine and magnetite.				
Thin Section:	254SP06 x13	**Grain size:**	<0.1-2 mm	**Body or Form.:**	ME
Location:	18°09'44"N	**Texture:**	Foliation	**Int. or Cont.:**	Contact
	067°03'36"W		S-C structure	**Orientation:**	342°, 48° NE C-plane
Rock:	Serpentinite		Nonpseudomorphic		225°, 17° SE S-plane
Where sampled:	rock mass		Interlocking		Top to E
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Serpentine	60	0	<-/-/0.1	Anhedral	elongated
Bastite	5	0	<-/0.6/0.1	Anhedral	
Magnetite	30	0	<0.1/2/0.1	Anhedral	elongated, mantled
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Brown Isotropic	5	0	<-/1/0.2	Anhedral	
Deformation:	bastite: undulose extinction; S-C structure; Faults cut folded foliations; foliation defined by elongated serpentine and magnetite.				
Thin Section:	254SP06 13	**Grain size:**	<0.1-2 mm	**Body or Form.:**	ME
Location:	18°09'44"N	**Texture:**	Foliation	**Int. or Cont.:**	Contact
	067°03'36"W		S-C structure	**Orientation:**	342°, 48° NE C-plane
Rock:	Serpentinite		Nonpseudomorphic		225°, 17° SE S-plane
Where sampled:	rock mass				Top to E
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Serpentine	60	0	<0.1/-/0.1	Anhedral	
Bastite	5	0	<-/1.5/-	Anhedral	
Magnetite	30	0	<-/1.2/-	Anhedral	and Chr-Spinel
Brown Isotropic?	4		<-/1/0.4		
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Talc	<1		<-/0.5/0.3	Anhedral	
Chlorite	<1		<-/-/1	Anhedral	Berlin Blue
Deformation:	bastite: undulose extinction; S-C structure; Faults cut foliations; Mantled bastites; foliation defined by elongated serpentine and magnetite.				
Thin Section:	284SP06 x1	**Grain size:**	<0.1-5 mm	**Body or Form.:**	ME

Location:	18°08'51"N	**Texture:**	Foliation	**Int. or Cont.:**	Contact
	066°57'02"W		Porphyritic bastite	**Orientation:**	200°, 40° SE C-plane
Rock:	Serpentinite		Nonpseudomorphic		296°, 32° NE S-plane
Where sampled:	Serp. Cgl.		Interpenetrating		Top to S
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Serpentine	65		<0.1/0.3/0.2	Anhedral	elongated
Bastite	15		0.5/5/2	Anhedral	from OPX
Brown Isotropic	10			Anhedral	Fractured
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Magnetite	5		<0.1/1.5/0.2	Anhedral	
Deformation:	bastite: undulose extinction; S-C structure; Sheared conglomerate; folded foliations; foliation				
defined by elongated serpentine, bastite, and brown isotropic.					
Thin Section:	284SP06 y2	**Grain size:**	<0.1-4 mm	**Body or Form.:**	ME
Location:	18°08'51"N	**Texture:**	Foliation	**Int. or Cont.:**	Contact
	066°57'02"W		S-C structure	**Orientation:**	200°, 40° SE C-plane
Rock:	Serpentinite		Transitional		296°, 32° NE S-plane
Where sampled:	Serp. Cgl.		Porphyritic bastite		Top to S
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Serpentine	65	100	<0.1/0.5/0.2	Anhedral	elongated
Bastite	10	100	0.5/3/1	Anhedral	from OPX
Talc	2	0	0.1/1.5/0.2	Anhedral	kinked, tabular
Brown isotropic	10	0	0.2/4/0.5	Anhedral	folded
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Magnetite	5	0	<0.1/1/0.1	Anhedral	
Deformation:	bastite: undulose extinction, kinked, bent; S-C structure; fractures; folded foliations; foliation				
defined by elongated serpentine. Pieces of mesh and ribbon texture.					
Thin Section:	290SP06 1	**Grain size:**	<0.1-4 mm	**Body or Form.:**	G
Location:	18°04'48"N	**Texture:**	Foliation	**Int. or Cont.:**	Contact
	067°03'44"W		Porphyritic bastite	**Orientation:**	N/A
Rock:	Serpentinite		magnetite, and		
Where sampled:	foliated rock		Brown isotropic		

Prim. Mineralogy	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Serpentine	30		<0.1/4/0.2	Anhedral	Does it alter to clay?
Bastite	10		<0.1/0.5/0.2	Sub-Anhedral	

Sec. Mineralogy	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Magnetite	10		<0.1/1/0.2	Anhedral	
Brown Isotropic	5		<0.1/0.5/0.1	Anhedral	elongated

Deformation: bastite: undulose extinction; S-C structure; clasts with mesh texture; folded foliations. foliation defined by elongated serpentine, brown isotropic, and magnetite.

Thin Section:	294SP06 A	**Grain size:**	<0.1-3 mm	**Body or Form.:**	ME
Location:	18°11'30"N	**Texture:**	Transitional	**Int. or Cont.:**	Contact
	067°08'05"W		Foliated	**Orientation:**	322°, 42° SW C-plane
Rock:	Serpentinite		Pseudomorphic		345°, 72° SW S-plane
Where sampled:	rock mass		Interpenetrating		Top to E

Prim. Mineralogy	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Serpentine	70	100	<0.1/2/0.1	Anhedral	mesh and sheared
Bastite	15	90	0.1/3/0.5	Anhedral	from OPX
Talc	10	0	0.1/1/0.4	Anhedral	folded

Sec. Mineralogy	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Magnetite	5		<0.1/0.8/0.2	Sub-Anhedral	

Deformation: bastite: undulose extinction, kinked, elongated; S-C structure; Fractures form C-plane; foliation defined by elongated serpentine. Large pieces of strained mesh texture into ribbons. Interlocking Texture.

B.3 SEDIMENTARY SERPENTINITE

Thin Section:	2SP06	**Grain size:**	<0.1-4.5 mm	**Body or Form.:**	ME
Location:	18°09'02"N	**Texture:**	Mud-supported	**Int. or Cont.:**	Contact
	067°02'11"W		rounded-subang.	**Orientation:**	N/A

Rock:	Serp. Breccia		poorly sorted		
Where sampled:	matrix				

Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Serpentine	15	0	0.1/0.4/0.3	Anhedral	
Bastite	10	100	0.2/1.5/0.4	Anhedral	
Talc	<1	0	0.1/1/0.3	Anhedral	in veins and clasts
Brown isotropic	5	0	0.4/2.5/0.5	Anhedral	

Matrix	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Serpentine	65		<-/-/0.1	Anhedral	

Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Magnetite	2	0	<0.1/1/0.1	Anhedral	
Amphibole	<1	0	<-/-/0.2	Subhedral	

Deformation: bastite: undulose extinction, kinked; S-C structure; "Fern-like" serp. and veins within clasts.

Serpentinite clasts with pseudomorphic texture, some replaced by Interlocking Texture.

<u>Thin Section:</u>	3SP05	**Grain size:**	<0.1-4.5 mm	**Body or Form.:**	ME
Location:	18°10'36"N	**Texture:**	Mud-supported	**Int. or Cont.:**	Contact
	067°05'57"W		angular-subround.	**Orientation:**	N/A
Rock:	Conglomerate		poorly sorted		
Where sampled:	rock mass				

Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Serpentine	10		0.1/1/0.2		
Brown isotropic	10		<-/4.5/0.5		
Talc	<1		<-/0.8/0.2		
Bastite	5		<-/2.5/0.4		

Matrix	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Serpentine	60		<-/-/<0.1	Anhedral	

Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm)** min/max/avg	**Morphology**	**Comments**
Magnetite	15		<0.1/0.5/0.1	Anhedral	
Chlorite?	<1		<-/-/0.3	Anhedral	Berlin blue

Deformation: bastite: undulose extinction; "Fern-like" serp. clasts. Layering defined by aligned clasts.

Serpentinite clasts with pseudomorphic texture.

Thin Section:	118SP06	**Grain size:**	<0.1-3 mm	**Body or Form.:**	ME
Location:	18°04'47"N	**Texture:**	Mud-supported	**Int. or Cont.:**	Contact
	066°56'27"W		angular-subround.	**Orientation:**	N/A
Rock:	Pebbly SS		poorly sorted		
Where sampled:	rock mass				
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Serpentine	10	100	0.1/2.5/0.2	Anhedral	ribbons, fern-like veins
Bastite	10	100	0.1/3/0.3	Anhedral	
Brown isotropic	5	0	0.2/1.5/0.5	Sub-Anhedral	
Talc	1	0	0.1/0.4/0.2	Anhedral	clasts and in veins
Matrix	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Serpentine	65	0	<-/-/<0.1	Anhedral	
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Calcite	<1	0	<-/-/0.2	Anhedral	
Magnetite	10	30	<0.1/0.5/0.2	Anhedral	to hematite
Deformation:	bastite: undulose extinction; "Fern-like" serp. clasts. Fractures cut texture.				
Serpentinite clasts with pseudomorphic texture.					

Thin Section:	254SP06 a	**Grain size:**	<0.1-2 mm	**Body or Form.:**	ME
Location:	18°09'44"N	**Texture:**	Massive	**Int. or Cont.:**	Contact
	067°03'36"W		angular-subang.	**Orientation:**	N/A
Rock:	Serp. Breccia		poorly sorted		
Where sampled:	at Yauco contact		pebbles		
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Serpentine	27		<-/-/0.2	Anhedral	
Bastite	10		<-/1.8/0.5	Anhedral	
Brown isotropic	5		<-/1/0.2	Anhedral	opaque, no cleavage
Matrix	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Serpentine	15		<-/-/0.1	very fine	
Clay?	35		<-/-/0.1	very fine	
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**

Magnetite	5		<-/2/0.2	Anhedral	
Talc	2		<-/-/0.1	Anhedral	kinked
Chlorite?	1		<-/-/0.2	Anhedral	berlin blue

Deformation: Pieces of "Fern-like" serp.veins within clasts. Fractures cut matrix and clasts

Serpentinite clasts with pseudomorphic and Interlocking Texture.

Thin Section:	285SP06 b	**Grain size:**	<0.1-16 mm	**Body or Form.:**	ME
Location:	18°03'19"N	**Texture:**	Mud-supported	**Int. or Cont.:**	Contact
	066°58'55"W		angular-subang.	**Orientation:**	N/A
Rock:	Breccia		poorly sorted		
Where sampled:	rock mass				

Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Serpentine	15	100	<-/0.5/0.2	Anhedral	
Bastite	10	100	<-/4/0.5	Anhedral	
Talc	2	0	<-/0.6/0.2	Anhedral	kinked
Brown isotropic	3	0	<-/1/0.2	Anhedral	

Matrix	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Serpentine	60		<-/-/0.1	Anhedral	

Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Magnetite	10	0	<0.1/0.5/0.2	Anhedral	

Deformation: bastite: undulose extinction, subgrains, kinked; "Fern-like" serp., sheared serp. within clasts.

Serpentinite clasts with pseudomorphic and Interlocking Texture. Fractures.

Thin Section:	293SP06 6b	**Grain size:**	<0.1-9 mm	**Body or Form.:**	G
Location:	18°05'03"N	**Texture:**	Mud,clast-supp.	**Int. or Cont.:**	Contact
	067°00'46"W		angular-subang.	**Orientation:**	N/A
Rock:	Serpentinite		poorly sorted		
Where sampled:	Congl. Block		Breccia		

Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Serpentine	30		<-/1/0.2	Anhedral	
Bastite	20		<-/7/1.5	Anhedral	
Talc	5		0.5/9/1	Anhedral	in veins and clasts
Brown isotropic	10		<-/1.5/0.3	Anhedral	

Matrix	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**

Serpentine	15		<-/-/0.1	Anhedral	
Clay?	15		<-/-/0.1		

Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Magnetite	5		<0.1/1.5/0.2	Anhedral	

Deformation: bastite: undulose extinction, kinked; "Fern-like" serp. and ribbon serp. within clasts.

Serpentinite clasts with pseudomorphic texture, some replaced by Interlocking Texture.

Thin Section:	293SP06 1	**Grain size:**	<0.1-10 mm	**Body or Form.:**	G
Location:	18°05'03"N	**Texture:**	Breccia	**Int. or Cont.:**	Contact
	067°00'46"W		angular-subang.	**Orientation:**	N/A
Rock:	Sandy congl.		mud-supported		
Where sampled:	layer		poorly sorted		

Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Serpentine	20		<-/0.4/0.2	Anhedral	
Bastite	3		<-/-/0.1	Anhedral	from OPX
Talc	1		<-/-/0.2	Anhedral	kinked
Brown isotropic	1		<-/-/0.2	Anhedral	

Matrix	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Serpentine	25		<-/-/0.1	Anhedral	
Clay?	35		<-/-/0.1		

Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Magnetite	10		<-/1/0.1	Anhedral	

Deformation: grading, fractures, layering defined by aligned clasts; "Fern-like" serp. clasts.

Serpentinite clasts with pseudomorphic texture.

Thin Section:	294SP06 B	**Grain size:**	<0.1-19 mm	**Body or Form.:**	ME
Location:	18°11'30"N	**Texture:**	Mud-supported	**Int. or Cont.:**	Contact
	067°08'05"W		angular-subang.	**Orientation:**	N/A
Rock:	Serpentinite		poorly sorted		
Where sampled:	Purple sandy serp.				

Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Serpentine	20		<-/0.5/0.3	Anhedral	
Talc	1		<-/1.5/0.2	Anhedral	
Brown isotropic	4		<-/0.8/0.4	Anhedral	
Bastite	10		<-/3/1	Anhedral	

Matrix	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Serpentine	60		<0.1/-/-	Anhedral	

Sec. Mineralogy	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Magnetite	5	0	<-/1.2/0.2	Anhedral	

Deformation: bastite: undulose extinction, kinked, bent faulted; Faults cut texture.

Serpentinite clasts with pseudomorphic texture.

Thin Section:	296SP06 1	**Grain size:**	<0.1-2 mm	**Body or Form.:**	ME
Location:	18°10'54"N	**Texture:**	Mud-supported	**Int. or Cont.:**	Internal
	067°06'36"W		Angular-subroun.	**Orientation:**	N/A
Rock:	Serpentinite		poorly sorted		
Where sampled:	Sandy serp.		Sandstone		

Prim. Mineralogy	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Serpentine	15	100	<-/0.8/0.2	Anhedral	
Talc	5	0	<-/0.5/0.2	Anhedral	
Brown isotropic	5	0	<-/0.5/0.3	Anhedral	
Bastite	5	100	<-/0.5/0.2	Anhedral	

Matrix	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Serpentine	60	100	<-/-/<0.1	Anhedral	

Sec. Mineralogy	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Magnetite	10	40	<-/0.8/0.2	Anhedral	
Chlorite?	<1	0	<-/-/0.4	Anhedral	

Deformation: bastite: undulose extinction; layering defined by aligned clasts; "fer-like" clasts;

Serpentinite clasts.

Thin Section:	297SP06 2	**Grain size:**	<0.1-4 mm	**Body or Form.:**	ME
Location:	18°10'56"N	**Texture:**	Mud-supported	**Int. or Cont.:**	Internal
	067°06'57"W		Angular-subang.	**Orientation:**	N/A
Rock:	Serpentinite		poorly sorted		
Where sampled:	Sandy serp.				

Prim. Mineralogy	% Observed	% Altered	Size (mm) min/max/avg	Morphology	Comments
Serpentine	13	100	<-/0.4/0.2	Anhedral	
Bastite	5	100	<-/4/0.3	Anhedral	
Brown isotropic	10	0	<-/1/0.5	Anhedral	

Talc	2	0	<-/0.4/0.2	Anhedral	
Matrix	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Serpentine	60	100	<-/-/<0.1	Anhedral	
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Magnetite	10	80	<0.1/1.5/0.3	Anhedral	to hematite
Deformation:	bastite: undulose extinction; pseudomorphic texture replaced by Interlocking Texture.;				
Faults cut texture.					
<u>Thin Section:</u>	287SP06 b1	**Grain size:**	<0.1-2 mm	**Body or Form.:**	G
Location:	18°05'39"N	**Texture:**	Mud-supported	**Int. or Cont.:**	Contact
	067°02'17"W		Angular-subroun.	**Orientation:**	N/A
Rock:	Sandstone		poorly sorted		
Where sampled:	rock mass		massive		
Prim. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Calcite	20		0.1/3/0.5	Anhedral	
Serpentine	10		<0.1/0.3/0.1	Anhedral	
Bastite	5		0.1/1.5/0.5	Anhedral	
Brown Isotropic	3		0.2/1.2/0.4	Anhedral	
Matrix	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Serpentine	55		<-/-/<0.1	Anhedral	
Sec. Mineralogy	**% Observed**	**% Altered**	**Size (mm) min/max/avg**	**Morphology**	**Comments**
Magnetite	5		<0.1/0.5/0.1	Anhedral	
Talc	<1		<-/-/0.1	Anhedral	
Deformation:	bastite: undulose extinction, kinked;Calcite cement and veins; serp. Veins cut bastite clasts				
Serpentinite clasts with pseudomorphic and Interlocking Texture. Fractures.					

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